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Contents

	PAGE
Editorial Notes: Alkali Inspection and Special Research; Factory Inspection; An Industrial Gas Mask; Practice with Science; Industry and Thrift	119
Alkali Works Report—(1)	122
Reviews	125
Correspondence: The Claims of the Blind (Sir ARTHUR PEARSON); Canadian Invitation to Engineers (J. B. TYRRELL); Corporation Profits Tax ("ECONOMIST"); The Revolution in America (HENRY HILDITCH)	126
Economics in America. By ERNEST J. P. BENN	128
Week-end Conferences on Industry	129
Improved Centrifugal Separation of Oil from Soap Stock. By A. DELAFONTAINE	130
Manchester Chemical Trade	131
Chemical Matters in Parliament	132
From Week to Week	134
References to Current Literature	135
Patent Literature	136
Market Report and Current Prices	139
Commercial Intelligence	142

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Alkali Inspector and Special Research

IN last week's issue we commented briefly on the Alkali Works Report recently presented by Dr. Lewis T. Bailey. As usual one can have nothing but admiration for the highly serviceable technical facts which have once more been collated; our only regret is that such valuable information should not be available to the chemical world a little earlier than six months after the period to which it refers.

Apart from work in connexion with the official supervision of chemical undertakings the staff of the Chief Inspector invariably finds time to carry out a certain amount of research on definite lines, and of direct utility in manufacturing operations. For instance, Mr. Curphey, the late head of the department, mainly interested himself in the defects which seem to beset the modern system of recovering sulphate of ammonia by semi-direct processes, and the derangement of the oxide of iron purifiers which frequently follows such processes. The oxide purification process has usually been regarded as one of exceptional simplicity, proceeding on the line of equations which represent the ferric oxide (or hydrate) as a catalyst promoting combination of sulphuretted hydrogen and oxygen, and itself ultimately appearing without change. In practice, however, results are often the reverse of what is anticipated, and purifiers behave with the most provoking irregularity, even when suitably charged and carefully controlled.

It is clear, therefore, that whatever be the nature of the primary reactions that take place (and there is good reason for believing that they are free from complication), secondary reactions occur which are of importance in determining the regular working of the system. The nature of these secondary reactions has been the subject of repeated discussions, and there is reason to hope that further experience will enable the chemist to exercise complete control over the purification process, which, in a well-conducted works, should be operated with as much care as the coal carbonising process itself.

Should new processes be developed, or should the normal current defects be overcome, much of the credit will be due to the attention which the matter has received—and is still receiving—from the Chief Inspector's department. As Dr. Bailey says, catalytic processes are widely applied for many purposes to-day, and the conditions making for efficiency are now better understood. Catalysts, in general, are extraordinarily sensitive to degradation by what are termed "inhibitors" or "poisons," and the precautions necessary to ensure the purity of the combining gases in many processes would appear quixotic, were not practice abundantly justified by experience. Viewed as a catalyst, therefore, it might well be anticipated that the activity of the oxide of iron used in gas works purification would be closely related to its physical condition, and that failure would result when certain necessary precautions are omitted.

The work dealing with "burnt" oxide of iron is of considerable importance, for once the means for effectively preparing this material can be definitely prescribed an enormous saving in the purchase of new material from Continental sources must follow. The process, in fact, then becomes a cyclic one; and—apart from the replacement of a certain amount of waste—there should be no necessity for the introduction of fresh quantities of raw material. The present Report deals with experiments conducted with a "burnt" material obtained in the form of a filter-press cake, containing 67 per cent. of ferric oxide. The filter-press cake is "activated" for purification use by mixing with a small proportion of waste lime and 10 per cent. of fine coal silt, re-pressing, and burning. The resultant material is soft and somewhat friable, highly permeable to gases, and of a fine brick-red colour. In fact, the material possesses all the properties of an active catalyst, promoting the combination of sulphuretted hydrogen and oxygen, and itself undergoing no apparent change of condition, either chemical or physical. In this respect the particular burnt oxide tested would appear to be an ideal catalyst for oxide purification, as its activity maintains itself equally

with sulphuretted hydrogen or oxygen in excess. The fresh oxide, however, is markedly more active as a catalyst than the product obtained after continued use, and extraction by carbon bisulphide, though it effects some increase in activity, does not restore the material to its original condition. The latter fact is, perhaps, a little disturbing, but further investigation will, no doubt, shed more hopeful light on it.

The experiments conducted in connexion with wood charcoal as a medium for removing sulphuretted hydrogen are particularly interesting, although they have not as yet been taken very far. Sufficient data were, however, obtained to establish the fact that the action of wood charcoal is essentially different from that of the oxide under precisely similar conditions respecting temperature, pressure, and composition of the reacting gases. With the " burnt " oxide reactions are characterised by maximum production of free sulphur, and minimum production of sulphur oxidation compounds; with wood charcoal there is marked production of acid products, with limited production of free sulphur. Analysis of the residual gases in the case of wood charcoal indicates that results are here complicated by a large occlusion of the combining gases, and no simple representation of the reactions is possible as in the case of " burnt " oxide.

Factory Inspection

THE annual report of the Chief Inspector of Factories and Workshops for 1920 (Cmd. 1403, 1s. 6d.) refers to the considerable reduction in the number of offences and prosecutions as evidence of " a greatly improved spirit abroad." In spite of the great trade depression during the year registered factories increased from 135,454 in 1919 to 140,064 in 1920, while workshops continued to decline, the numbers being 141,971 in 1920, compared with 145,737 in 1919, and 153,797 in 1914. The number of persons employed in all factories in 1919 was 6,127,706, of whom 2,157,783 were females, the corresponding figures for 1913 being 5,342,625 and 1,725,912. Thus, in 1919, when practically all the females taken on as substitutes for men during the war had given up their occupations, there were employed in factories alone 430,000 more females than in 1913, while at the same time there were 350,000 more males.

During the year the inspectorate has been busy in converting into Regulations the remaining codes of Special Rules—namely, those for white lead factories, chemical works, bottling of aerated water, vulcanising indiarubber by means of bisulphide of carbon, and handling dry and drysalted hides and skins imported from China and the West Coast of India. Opportunity has been taken for bringing them up to date and extending their scope where necessary. Up to the end of the year draft Regulations had been issued for the manufacture of white compounds of lead, chemical works, the handling of dry or drysalted hides and skins imported from Africa (including Madagascar), or Asia (including Japan and the Malay Archipelago), and since the end of the year, for the manufacture of aerated water and processes incidental thereto, and for the manufacture of indiarubber and of articles or goods made wholly or partially of indiarubber.

On the subject of industrial developments and state of trade, the Chief Inspector's report is rather gloomy, but it should be remembered that it was written probably in a period of depression from which we are beginning now to emerge. Even at the worst, however, he is able to pick out a few bright spots. One of these is concrete block and cement making, and in several trades considerable developments are reported. He particularly mentions, as a notable departure in the Stockton district, the erection at the Skinningrove works of a plant on the cell principle for the deposition by an electrostatic process of dust from blast furnace gas in order to make the gas available for the generation of power as well as heat in the works. From the dust are recovered high percentages of potash and other valuable chemicals. Another interesting development at Drogheda, Ireland, is a dead meat industry on American lines. When the works are completed every part of the animals slaughtered will be utilised, and all except the horns, which are only cleaned and graded, will be sent out as manufactured products. Even trimmings, waste fat, and bones are treated, the fat being recovered for use in the manufacture of oleomargarine, and the residue, after further treatment, is sold as a high class fertiliser.

The report, altogether, is one of great interest, not only as regards technical and economic matters, but especially in its bearing on the human side of industry.

An Industrial Gas Mask

THE first approval of an industrial gas mask for use in ammonia fumes has been issued by the United States Bureau of Mines to the Mine Safety Appliances Company of Pittsburg, Pa. The Burrell ammonia mask successfully passed the tests applied by the Bureau's chemists in accordance with Schedule 14, " Procedure for establishing a list of permissible gas masks."

The gas mask used during the war by the United States Army was largely developed under the direction of the Bureau of Mines and the Chemical Warfare Service. Since the war the Bureau of Mines has been engaged in adapting and developing the gas mask for industrial purposes and promoting its safe usage. The Burrell ammonia mask consists of an Akron type, Tissot face piece that allows breathing through the nose, fitted with a special ammonia canister containing copper sulphate pumice-stone mixture devised by G. St. J. Perrott, Max Yablick and A. C. Fieldner for the Ordnance Department of the United States Army. It has been found to give absolute protection in any percentage of ammonia gas which the wearer of a mask can stand without unbearable skin irritation.

The canisters submitted by the Mine Safety Appliances Company protected successfully against 3 per cent. of ammonia at a breathing rate of 64 litres per minute for a period of five minutes. This represents the maximum concentration that anyone is likely to enter, as it has a very strong action on the skin. In a concentration of 2 per cent. ammonia and a breathing rate of 32 litres per minute, corresponding to active work, 6 canisters gave a service period of 30 to 41 minutes. The requirement for approval is 20 minutes

Special tests of the face pieces fitted with special canisters were made in 1 per cent. of sulphur dioxide gas in air, since sulphur dioxide gives a more severe test for face piece leakage than ammonia. Two

observers remained in the gas chamber for a total time of 30 minutes. Part of the time was spent in doing vigorous work. There was no appreciable leakage in either mask. All the other tests were likewise passed successfully.

Approval 1401 issued to cover this mask states that the mask is approved for safety, practicability and efficiency in concentrations of ammonia in air not exceeding 3 per cent. for short periods of time, as 10 minutes, or for periods of 20 to 30 minutes in air not exceeding 2 per cent. ammonia, and for proportionately longer periods of time in lower concentrations. The replaceable canisters were approved for use only with approved face pieces and harness. Permissible ammonia masks under this approval will hereafter bear a plate with the seal of the Bureau of Mines approval and caution clause to promote safe usage.

Practice with Science

It is a growing custom amongst authors of technical books to prevail upon some recognised authority having a name which is a household word in some particular branch of industry to subscribe an introductory note or foreword to such books. It is a matter of opinion as to whether the procedure is of any real value, for in so many instances the author merely obtains a solicited testimonial to his ability, and gets somebody else to say those things about him which modesty forbids he should say about himself. The result is that the majority of these outside introductions contain little of any technical value, and usually border on being fulsome. Occasionally, however, one meets with exceptions, and we have been prompted to refer to the matter by the foreword which has been contributed to a useful booklet on "Coal Economy" that has recently been sent to us.

In this instance the foreword is written by one who frankly admits that in technical directions he is practically unknown, but the remarks which follow can only lead one to the conclusion that notoriety is not necessarily a guarantee of sound reasoning. In fact, we have in this case one of the most businesslike introductions which we have yet come across, and it sums up in concise and well-judged terms the real reason why economy in fuel proceeds so slowly. The writer poignantly remarks, for instance, that we have many able scientific men who are not only non-practical, but who hold practical men more or less in contempt. On the other hand, our practical men are disposed to regard academic and scientific men in like manner. He goes on to state that in no other industrial country is the distinction so marked. In America, Switzerland, France and Germany the two sections appear to pull together under conditions of harmony and mutual esteem, each recognising that it has much to learn from the other. All will agree that there is a good deal of rather unpleasant truth in this argument, although the gap has shown some tendency to close during the past few years. The aim of all, however, should be—whichever category they belong to—to appreciate that the *ne plus ultra* can only be attained by taking advantage of every means at their disposal. As the writer we have quoted puts it so far as fuel economy is concerned—the gap between the laboratory and the stokehold must be bridged.

Industry and Thrift

At the representative meeting on Tuesday in the Mansion House of merchants, manufacturers and shipowners no sentiment was more heartily endorsed than that of the restoration of freedom in the management of industry. Leaders of commercial and financial opinion in the City, it is clear, have no faith in salvation by law. In the matter of departmental control of industry they demonstrated not merely a negative lack of faith, but a most active resentment. Government by officials was denounced with as much energy as was permissible in so decorous an atmosphere. The resolution passed, as Mr. Walter Leaf stated, contained little but truisms, but the fact that a Mansion House meeting should be necessary for their re-statement shows how far they have been allowed to be obscured. Drastic economy, liberty from official interference, greater industry all round, and loyal co-operation between capital and labour were the points most constantly insisted on as necessary for the restoration of British credit. The reference to the work of the Government betrayed the modern business man's complete distrust of party politics, and his urgent desire to see all parties to industry taking upon themselves the responsibility of re-establishing the trade and finance of the nation.

The Calendar

Aug. 6	North of England Institute of Mining and Mechanical Engineers. Annual meeting, 2 p.m.	Newcastle-upon-Tyne.
13	Mining Institute of Scotland: General meeting.	Glasgow.
29	Society of Chemical Industry: Annual general meeting.	McGill University, Canada.
Sept. 7-14	British Association for the Advancement of Science: 89th Annual Meeting: "Some Aspects and Problems of Post-war Science, Pure and Applied," by Sir Edward Thorpe, the President.	Edinburgh.
21-23	Institute of Metals: Annual meeting.	Birmingham.
28	Faraday Society: "Catalysis, with Special Reference to Newer Theories of Chemical Action." General discussion.	—
Oct. 19-29	Royal Photographic Society of Great Britain: 66th Annual Exhibition.	35, Russell Square, London, W.C. 1.

Books Received

Coal Economy. By W. H. Casmey. London: Charles Griffin & Co., Ltd. Pp. 52. 2s. net.

T.N.B. and T.N.T. (Trinitrobenzene and Trinitrotoluene). By Captain M. Kostevitch, Russian Guards Artillery. Pp. 38.

High Explosives and Smokeless Powder Testing Electrical Apparatus. By M. Kostevitch.

Physical Chemistry for Colleges. By E. B. Millard, London. McGraw-Hill Book Company, Inc. Pp. 411. 21s. net.

The Chemical Trade Year Book and Buyers' Guide. 1921. London: Bandon & Morris. Pp. 304. 12s. 6d. net.

Fundamental Principles of Organic Chemistry. By Charles Mourew. London: G. Bell & Sons, Ltd., pp. 399. 12s. 6d. net.

A French - English Dictionary for Chemists. By Austin M. Patterson, New York. John Wiley & Sons, Inc., London: Chapman & Hall, Ltd. Pp. 384. 18s. net.

Alkali Works Report—(I.)

The fifty-seventh Report of the Chief Inspector under the Alkali Acts was briefly referred to in our editorial columns last week. Below is given an abstract of the more important features of the Report, the later portions of which will be dealt with next week.

AFTER referring to various changes in administration the Chief Inspector (Dr. T. Lewis Bailey) remarks that during 1920 the number of registered works was 1,383, a total reduction of 20 as compared with the previous year.

Sulphuric acid, gas-liquor and nitric acid works have been dropping off the list since the armistice, and their numbers have got back to approximately those of pre-war days. Exigencies of the war period are indicated by a comparison of the tables of processes since 1914, and such comparison provides further proof of the way in which the chemical trade rose to the needs of those critical years. It shows that the number of gas-liquor works registered in 1914 was 56, but by 1916 they had increased to 81, and by 1919 to 107; now they are back to 92, which figure points to somewhat altered conditions from those of pre-war days; the variations noted were, of course, due to fluctuations in the number of works producing concentrated ammoniacal liquor.

As regards nitric acid works the number registered in 1914 was 70; a rapid increase brought the number up to 100 by 1916, and now it is down almost to the 1914 figure. There were 93 sulphuric acid works in 1914; the maximum during the period under review was 138, but now there are 105.

The number of complaints from external sources has been larger than usual, but it cannot be said that this is due to any serious deterioration obtaining in the works. During the war period conditions in some quarters were certainly not so good as previously, by reason of the pressure of work in producing the enormous quantities of war material, the difficulties experienced through much of the work having to be done by workpeople who were quite unused to the operations, and the impossibility of getting repairs to plant effected, either through the absolute necessity of keeping up production or the inability to obtain material for repairs. Damage was done and annoyance caused, and these were suffered under protest. But the then conditions of existence generally have had their effect on the public temperament, and in many instances one has noted of late a proneness to complaint, which did not exist under similar conditions some years ago. The weighing of evidence as to nuisance and damage is always a very difficult and delicate matter. Inspectors cannot be always on the spot, but frequent visits at irregular intervals give a satisfactory indication of the general working of plant; the question is then narrowed down to special circumstances, and it is usually possible to obtain sufficient proof to lead to definite conclusions with regard to occasional outbreaks.

With particular reference to the complaints received during the past year, chlorine has been responsible for several. Trade changes have brought in new processes, and such bring with them, to a certain extent, unknown factors; difficulties, which cannot always be foreseen, crop up, and, when they arise, they must be promptly tackled, but the annoyance due to any escape of such a gas as chlorine is apt to be considerable. It is doubtless unfortunate that works of this nature should be surrounded by dwelling houses, but the fact remains that existence of the works constituted the origin of the dwellings.

During a wet season any gases coming from chemical works diffuse less readily than in dry weather, they keep low and are ultimately washed out of the atmosphere by rain on to the neighbouring land, but it does not necessarily follow that abnormal condition of crops is due to inefficient control or undue emission of fumes from the works. During the first half of the year 1920 the weather conditions were particularly bad, and were such that one found crops absolutely ruined in rural districts far removed from any industrial area.

Accidents due to Gas Poisoning

The year was fairly free from serious accidents due to noxious gases. Three fatalities occurred at tar works. In one case a workman was overcome while clinkering the still fire; oxygen treatment revived him, but he died 24 hours later: the bulk of the evidence pointed to poisoning by carbon monoxide. In the other cases the noxious gas was sulphuretted hydrogen, inhaled during the cleaning of plant interior. During the cleaning of stills physical isolation is absolutely essential, as also is thorough ventilation. Sulphuretted hydrogen was responsible also for the gassing of four men at the large sulphate of ammonia plant of a coke oven works; fortunately all recovered. The accident occurred during the clearing of a blockage. The district inspector happened to be visiting the works at the time of the occurrence, and was thus able to get valuable information by an immediate investigation. Improvements have been introduced, which should obviate any possibility of a similar occurrence in future. It is very desirable that the district inspector should be informed of cases of this kind at once, so that investigation can be made (with a view to the prevention of such accidents) before important details have escaped the memory of any of those present at the time.

There was one fatality during the cleaning of mixed acid tanks. One cannot too strongly emphasise the possible danger attending the entering of acid tanks for the purpose of cleaning. A high-pressure water hose will usually effect the removal of mud, and such hose can be manipulated from outside the tank. Should entry of a workman be absolutely necessary for any purpose, the possible presence of nitrous or other noxious gas should be guarded against, and there should be thorough ventilation by a special supply of air; moreover, it should be borne in mind that, in the case of nitrous gases, absorption respirators are not to be relied on—they may even give a false sense of security.

Industries generally have been handicapped of late by the reduced quality of the coal supplied, and the alkali industry forms no exception. Inferior fuel has rendered difficult a proper distribution of heat throughout the system in the case of salt-cake furnaces and pots, and black smoke has been a source of trouble at some works. To meet the difficulty of unsatisfactory heat distribution, Mr. Porter suggested the introduction of a supply of preheated tertiary air into the fire flue, the point of admission being so chosen as to secure the necessary indraught on the air supply pipe. Pipes of various materials were experimented with; a cast-iron pipe of 4 in. diameter was found to give the best results, though the life is somewhat short. A secondary flue constructed within the primary flue appeared to allow of insufficient preheating. As a result of the modifications described charges are finished in shorter time, and incidentally black smoke is now no longer visible at any stage of the process. Prior to the introduction of this modification the pot received insufficient heat.

Cement and Smelting Works

There are now 50 such works registered, an increase of one. Great activity has again to be be reported in this industry; demand has exceeded available output, owing to the difficulty still experienced of completing repairs to both rotary kilns and machinery. Furthermore, unsatisfactory coal supply has limited the output of rotary kilns. Lack of skilled bricklayers has delayed repairs to chamber kilns, which had been idle during the war period, and supplies of coke for these kilns have been uncertain. Additional plant is under construction at several works. Slow progress is being made in the recovery of potash from cement kiln dust; but recovery is about to commence at one factory and arrangements are being made with the same end in view at another.

The spelter industry has fallen on evil days, and of late most of the works have been idle; consequently certain developments, anticipated in last year's report, have not materialised. The De Spirlet furnace has been introduced into this country. It is a calciner with a number of superimposed hearths, alternate hearths being capable of rotation by external mechanism. It is put forward as being capable of calcining zinc blende satisfactorily, and with the possibility of the sulphurous gases being employed in the manufacture of sulphuric acid.

Deposition of flue dust has been receiving considerable attention recently at several smelting works. Enormously extended flues are not necessarily the most satisfactory dust removers, and the difficulty and cost of cleaning are factors that need consideration.

There is much to be said in favour of deposition of dust comparatively close to the furnaces by electrostatic or other means.

Sulphuric Acid Works

The number of works registered shows a further reduction of four, being now 136.

Early in the year a new installation, the chambers of which were all of the Mills-Packard conical externally water-cooled type, commenced work. Pyrites forms the source of sulphur. Conditions stabilised remarkably quickly and the plant has worked exceptionally well; nitre consumption has been satisfactory and exit acidities have been consistently low. This type of plant dates from 1914 only, but it appears to be making its way, and that not with us only but in other countries also.

Where new installations are contemplated, factors now come into play, which were either unknown years ago or did not possess the same importance that they do to-day. Intensive working has much to be said for it, and in these days ground space and materials of construction are points carrying much greater weight than they used to do. It is interesting in this connection to glance backward. From the Annual Report for 1885 one learns that in Scotland and Ireland the chamber space per pound of sulphur burnt per 24 hours varied between as wide limits as 40 and 19 cubic feet (pyrites being used in the majority of the works); the average was 25·8 cubic feet (for 48 works). In the same year in the South-West of England the chamber space varied between 46 and 18 cubic feet, with an average of 28·4 (for 47 works). It is still common to find the older plants working at 18 to 20 cubic feet, but for quite a number of years past there has been a tendency to reduce the chamber space; water sprays are used in place of steam, the height of chambers being at the same time very considerably increased by reason of the adoption of the water sprays. The resulting intensive working has brought down the chamber space, in what one may call the ordinary chamber system, in many cases to 8 cubic feet per pound of sulphur burnt per 24 hours, and with the newer types of plant, such as the Mills-Packard and the Opl, a still further reduction is effected. Naturally, closer supervision is needed.

It is well that a word should be written regarding supervision in the works, for there is still in many works insufficient supervision of the type desirable, one may even say necessary, if the chemical trade of the country is to hold its own in these days of scientific progress. Chemical works ought not to be run on recipes, or, in other words, by rule of thumb.

Every chemical works should be provided with the means of scientifically investigating its own problems and scientifically controlling its own processes, for only in this way can the best economic conditions be attained. The first question asked regarding such supervision should surely be "what will it profit?" and not, "what will it cost?"

The use of the "Curphey" gas circulating injector has been extended. At one work in particular very marked results were obtained by means of one injector fixed at the back end of a chamber in which, owing to unusual conditions, the drips at the front end showed 110° Tw., whilst those at the back end showed 124°Tw. The result of the introduction of the circulating injector was an almost uniform drip of 118°Tw. At this work the use of one injector in each of the first and second chambers has resulted in increased efficiency of the plant.

The ammonia oxidation method of supplying nitrogen oxides to chamber plants seems to have definitely established itself, and its use is extending.

In the early days of the introduction of this method, control was a matter of some difficulty, but standard plants are now being made and adjustment has been simplified, so that control has become quite an easy matter.

Contact Processes

A considerable amount of oleum has been produced during the year, though not all plants have been in continuous operation: the future will doubtless see an increasing amount of high-strength vitriol made by the aid of this process. Considerable attention needs to be paid yet to the freeing of the burner gases from dust, preferably by electrical means, and to the proper working conditions of the contact chambers. The treatment of exit gases, too, is a point that must inevitably be considered; in one quarter this is actually being dealt with.

Chemical Manure and Sulphate Works

There is an increasing tendency to supersede manual labour by mechanical excavators for removing the superphosphate from the ordinary hand den, and recently new types of machines have been introduced, by means of which the material is removed in successive thin layers to a pit outside the den, whence it is transferred by elevators and conveyors.

Sulphate of Ammonia Works

The number of works registered for sulphate and muriate of ammonia was 631, a decrease of one; the number of gas liquor works, however, fell from 107 to 92. This does not mean the closing of works, but rather indicates that in those works, where facilities had existed for making either salts of ammonia or concentrated ammoniacal liquor, according to the demand, sulphate of ammonia has been produced solely, the abnormal requirements, as regards concentrated liquor supply, having disappeared. All over the country the by-product ammonia trade has been very brisk throughout the year.

The amounts of some of the materials in greatest use for the manufacture of chemical manures imported during the last three years were:—

		1920.	1919.	1918.
Guano.....	tons	12,740	101	Nil
Mineral phosphates	,,	523,350	351,187	464,747
Nitrate of soda	,,	147,477	24,485	300

The production of a dry neutral sulphate of ammonia is receiving increased attention and the arrangements for the installation of plant with this end in view are being made at an increasing number of works.

Demand for Oxygen

THE report of the British Oxygen Co., Ltd., for the year ended March 31 last states that business during the first half of the year showed most satisfactory progress, although during the second half increasing general trade depression began adversely to affect the company's progress, particularly in the engineering section. The demand for oxygen during the latter period was well maintained, and bears favourable comparison with the corresponding period of the previous year, but the increase in output which appeared to be assured in the earlier part of the year and for which additional plants had been provided, was not sustained. In the last month of the financial year general trade conditions were just beginning to show signs of recovery. This was being reflected in the company's business, when the coal strike occurred, which event created probably more serious and widespread dislocation of industry than has ever been experienced in this country. Although this set-back does not really bear upon the results of the year under review, its effect upon the current year has been to reduce the demand for oxygen to a figure which, for the first three months, represent about two-thirds that of the corresponding period of the last financial year.

Breach of Contract Claim Allowed

IN the King's Bench Division on Thursday before Mr. Justice Rowlatt, the British Merchants (Incorporated), Ltd., of Eastcheap, E.C., sued the London Hygienic Chemical Co., Ltd., Blackfriars Road, E.C., for the return of money that had been paid against chemicals manufactured by the defendants in accordance with an agreement. The action concerned a consignment of chemicals of the value of about £1,000 sent out to South America in 1919 as a joint venture, the profit or loss on the shipment to be divided among the parties. The goods were delayed and became useless. Plaintiffs paid £545 for half of the consignment and it was subsequently agreed that defendants should take over the stock, the plaintiffs to give defendants a delivery order on receipt of the payment. The defence was that there was no joint account arrangement but a sale to the plaintiffs and that when the goods were offered under the second agreement they were decomposed.

Judgment was given for plaintiffs for the amount claimed.

United Kingdom IMPORTS FROM GERMANY during June show a net decrease as compared with May, of £246,410. Increases, however, are shown under the headings of dyes and dyestuffs (£1,518) and scientific instruments (£1,053).

The Need for Agricultural Research

By a Research Chemist

THERE is no need to emphasise the great and growing importance of agricultural research in world economics. Food is the first material need of mankind and the problem of supplying it in adequate quantities for a growing population constantly pressing on present available resources is one of increasing difficulty and complexity. In terms of economic science the law of "diminishing returns" for equal expenditures of capital and labour on the land is now operating with ever-increasing intensity, and the only course to adopt is more intensive cultivation and a greater application of science, especially chemical science. Those countries like the U.S.A., the South American republics, and our own colonies are rapidly becoming more industrialised and populated and consuming an ever larger proportion of their own output of food and raw material. The older countries of Europe will thus have to seek new sources of supply—and there now seem to be very few left on this planet—or, so far as possible, supply their own needs. There is, in fact, no part of the world where it is possible to follow the old happy-go-lucky methods, for the extraordinary efficiency of scientific cultivation, in which chemistry plays a leading part, is such that it is the height of folly to neglect its aid.

The incalculable benefits conferred by chemical science on the greatest and oldest of our industries—agriculture—if adequately described, would make a long story, one of the greatest and most recent achievements in this direction being the fixation of atmospheric nitrogen. The profession of agricultural research chemistry is one to be proud of, for mankind will soon depend largely on him for its daily bread, and there is probably greater scope in this direction for the chemist than in any other field. It is one to be proud of even if the emoluments are not always commensurate with its importance. In this field, more than in many others, one can experience the joy of work done, and it is particularly congenial in some of its surroundings when it takes the chemist out into the fields and the open air, and brings him into closer touch with some of the wonders and beauties of nature. The common sneer against modern science that it makes a man arrogant, full of intellectual pride, and utterly lacking in a sense of reverence is often undeserved; and the agricultural chemist at all events will be among the first to acknowledge his limitations and the smallness of his knowledge compared with the work yet to be done.

The Rothamsted Station

Agricultural research in this country owes its inception largely to the enterprise and beneficence of one man—Sir John Laws—who endowed the Rothamsted Experimental Station in 1843. It was created a public trust in 1889, and it has now become one of the largest and best equipped agricultural research stations in the world, not even excepting some of the very elaborate establishments in the U.S.A. The far-sighted and wealthy business men of the U.S.A. have long realised that one of the best investments possible is scientific research, especially that connected with agriculture on which they must depend for their daily bread. Important work was also carried out at Woburn in this country, under the Royal Agricultural Society, by the late Dr. Voelcker, continued by his son, Dr. John A. Voelcker. It is rather unfortunate that this station has had to be closed, especially in view of the great wealth and influence which should be at the command of the R.A.S.E., the premier agricultural society in this country. It is, in fact, a pity that the other powerful agricultural associations in Britain do not make it one of the most important parts of their policy to further the cause of science in agriculture instead of limiting their activities almost entirely to the holding of shows. The motto of the R.A.S.E. it is interesting to note, is "Practice with Science."

Fortunately the Government, and still more the Universities and several more or less private institutions and agricultural colleges throughout the country have realised the paramount importance of agricultural research. In 1909 the Development Commission, whose report of ten years' work was recently published, was appointed, and formulated a scheme of work in which the whole field of research was divided up by subjects and allotted to particular universities or institutes. By this means research was removed from direct or immediate State control; concentration of effort was insured, overlapping and duplication avoided; and each institute could work out a continuing scheme of research and deal with a particular subject as a whole.

The question whether agricultural research should be directly organised under the State or by universities and kindred bodies is of considerable interest, and was discussed by Sir Daniel Hall at some length in a paper read before the Royal Society of Arts last February. The advantages of the greater freedom and more congenial atmosphere of the university or institute as compared with a purely Government department may be enumerated under three heads: (1) The true investigator is always somewhat anarchical in temperament, and will be far more likely to make good under the looser system of control prevailing in a university than in a Government department which is too fond of stereotyped routine, and, still worse, requires a cash justification every year for the expenditure involved, such justification being required by officials who have little knowledge and less sympathy with the work of the investigator, and are in no way competent to judge of his merits, for the immediate cash return is no criterion whatever. (2) A second advantage is the opportunity for co-operation and intercourse with the workers in other and related fields, whereby the evils of over-specialisation and narrow limitation of outlook are, to some extent, mitigated. (3) There is greater opportunity for co-operation with the practical farmer, a most essential point.

Central Boards of Experts

One form of organisation of research in close touch with the universities is that of the Medical Research Committee which has set up a central co-ordinating board of experts to survey the whole field, draw up a programme and allocate the work. Another somewhat different form was adopted by the Development Commissioners in the case of agricultural research, namely, the setting up of separate institutes, each dealing with one great division of work. In giving the reasons for this, Sir Daniel Hall says, "Agricultural research embraces a number of subjects which have little in common. The men working upon the nutrition of animals have little to do, either in their methods or objects, with the investigators of soil problems or with the students of diseases of plants." It is not quite easy to follow him here, for one would have thought these divisions of research were intimately related. However, there is no need to cavil at this, especially since Sir Daniel points out that, although the work has been organised under several more or less independent and self-contained institutes, he admits that some form of higher co-ordination will be necessary later.

The institutes which have been inaugurated up to the present are: (1) Soil and Nutrition of Plant, at Rothamsted; (2) Plant Pathology, at Rothamsted; (3) Animal Nutrition, at Cambridge and Aberdeen; (4) Plant-breeding, at Cambridge and Aberystwyth; (5) Fruit-growing, at Long Ashton, Bristol, and East Malling (Kent); (6) Dairying, at Reading; (7) Plant Physiology, at the Imperial College of Science; (8) Agricultural Economics, at Oxford. Beside these there is a small experimental station at Waltham Cross, under Rothamsted supervision, dealing with the problems of the fruit and vegetable-grower under glass. It is supported by contributions partly from the Development Commission and partly from those engaged in the industry. Diseases of animals are dealt with at a research laboratory at Addlestone. Finally, a fund of about £3,000 a year is at present available for making grants to individuals in furtherance of approved schemes of research.

The field is a very wide one to the research chemist, the work in most cases very congenial, and it offers great possibilities of the utmost importance to mankind. In a subsequent article some account of the work being done may be given. Meantime, the recent symposium on soil problems held by the Faraday Society will give some idea of the work to be done in one important branch. In a leading article on the subject on June 11, *The Times*, after indicating the serious limitations of purely *in vitro* experiments, emphasises the now well-known fact that there is far more in the soil than can be at present revealed by simple chemical analysis, *e.g.*, beneficent or malevolent bacteria, to say nothing of vitamines or auxiomes, and that the complexity of the soil gives scope for the combined efforts of all the natural sciences.

Reviews

VITAMINES—ESSENTIAL FOOD FACTORS. By Dr. Benjamin Harrow. Routledge & Sons, Ltd. Pp. 219. 10s. 6d. net.

In the difficult task of presenting to the non-technical reader the complex story of the recognition and importance of Vitamines in our food supply, Dr. Harrow has succeeded admi ably. Although written for the public at large, there is much in the book which will repay the attention of the average industrial chemist, specialised and often immersed in his own particular branch of science.

The first two chapters will, of course, be skipped by the chemist, but the non-scientific reader will find the author's popular explanations of chemical matters quite lucid. The following chapters (III—VIII) detailing the fundamentals of food chemistry, prior to the recognition of Vitamines, and particularly those devoted to a discussion of protein and carbohydrate metabolism, will interest and inform many chemists who have had little time to concern themselves with the chemistry of foods. They also emphasise the danger, which the very novelty of Vitamines may create, of the neglect of older but unsolved problems in the study of metabolic change.

Chapters IX—XIV furnish a careful account of the recognition of Vitamines and the gradual differentiation of the specific influences of the fat soluble A, the water soluble B and C Vitamines, in combating malnutrition and deficiency diseases, but the author's leanings towards physiological chemistry have induced him to make these chapters too detailed. The practical applications of the study of Vitamines in the production of "manufactured" foodstuffs are given too little consideration in proportion, and the effects of heat (cooking), and particularly of oxidation are neglected in large measure. The details of the physiological tests, however, bring out the pressing need for a quick chemical quantitative test for Vitamines.

Since the animal organism cannot synthesise Vitamines, we should have liked to see the questions of the influence of Vitamines in plant growth, and of the source of Vitamines more fully considered. The book is complete with valuable tables, bibliography and index. The publishers are to be congratulated upon presenting this type of popular scientific treatise.

K.

THE EXTRA PHARMACOPŒIA.—Vol. II. Seventeenth Edition. Revised by W. H. MARTINDALE, Ph.D., F.C.S., and W. W. WESTCOTT, M.B., D.P.H. London: H. K. Lewis & Co., Ltd. Pp. 688. 17s. 6d. net.

This volume forms an addendum to the first volume of the seventeenth edition of the work, which was issued in advance in June last year. The various sections of the book have been re-arranged to ensure a more logical sequence, and in making their additions under various headings the authors state they have submitted many of the statements of others in recent scientific literature to laboratory trials, and in following up these various opinions they have attacked numerous interesting problems.

A DICTIONARY OF CHEMICAL SOLUBILITIES INORGANIC. By Arthur Messinger Comey and Dorothy A. Hahn. London: Macmillan & Co. Pp. 1,141. 72s. net.

This publication is really an enlarged and revised edition of a similar but less comprehensive volume produced by Mr. Comey some years ago. The ever-increasing need for a compilation of this kind, carefully brought up to date, fully justifies the book, and in going through its pages one cannot but be impressed with the thoroughness of the undertaking. It is no light matter to bring together in a form easily referred to the mass of information available. The authors have been faced with the old problem of arrangement. Such a work is of little use unless the information contained in it can be extracted easily. This important part of the work has been carefully and thoughtfully done. One can describe it indeed as successfully done, but it is nevertheless a matter for regret that reference is not made doubly sure by an index arranged alphabetically according to formula. For instance the Sulphates are found in supplementary relation to the acid. The Chlorides, on the other hand, are given under the head of the metal concerned. There is no objection to this method once it is understood, but such a book is of the greatest value to the semi-technical man who may not have the time nor the desire to study the method of arrangement adopted by the authors. After all, with but few exceptions, the formula of any given inorganic chemical is well established as to its symbolic arrangement.

Another impression very vividly produced by the book, notwithstanding its exhaustive nature, is the enormous amount of information still badly wanted. The solubility of salts in solutions of other salts, and particularly in those solutions from which they are manufactured, is still little known. It is not the object of the authors to provide such information, and we merely make the observation wondering why more valuable work of this practical kind is not carried out year by year by the technical institutions. One can imagine no work better suited for the student. Some day no doubt these things will be done and published. In the meantime it is difficult to imagine a more useful addition to a laboratory or other scientific library than the volume under consideration.

H. E. C.

TABLES OF REFRACTIVE INDICES. Vol. II., Oils, Fats and Waxes. Compiled by R. Kanthack. Edited by J. N. Goldsmith, Ph.D., M.Sc., F.I.C. London: Adam Hilger, Ltd. Pp. 295. 25s. net.

The physical constant known as the Refractive Index has of late years been shown to yield valuable information in the examination of very many classes of chemical substances.

To the analyst it offers a rapid and reliable method, both of classifying and identifying unknown substances, and of detecting adulteration. To the technical and works chemist it is even more valuable, since not only does it give information as to the purity of commercial products, but the determination of the refractive index is now becoming a popular method for the control of very many products during manufacture.

For some time past Messrs. Hilger, who are well-known English manufacturers of refractometers, have promised a comprehensive list of recorded observations of the refractive index of oils, fats and waxes, in an accessible form. This has now been published and it reflects great credit both on Mr. Kanthack, who had the labour of compiling them, and on Dr. Goldsmith, who was responsible for the selection and presentation of the data. One cannot also commend too highly the enterprise of the manufacturers, Messrs. Hilger, for the initiation of this work, and for defraying the expenses involved. The result of these efforts is an extremely valuable and almost exhaustive record from many hundreds of sources of determinations of this figure, and in addition a valuable bibliography which will be of great service to those who wish to consult the original literature for other properties of the oils described.

In the preface it is stated that observations which appear discrepant have not been excluded, since oils and fats are complex substances and suffer considerable variation according to their source and the method used for their extraction, &c.

Mr. Kanthack also rightly lays great stress upon the accurate determination of the temperature coefficient, and has included this figure wherever it has been recorded.

As an appendix the figures recorded by Fryer & Weston and by Szalagyi for the dispersion of oils are also given, and these should be of considerable value as a reference for future investigators.

The letterpress and the general arrangement of the book leave little to be desired, the oils and fats being presented in alphabetical form and blank pages included for further references and for personal notes. The tables should prove indispensable, not only to analysts and technical chemists, but to all who are concerned with the scientific side of this branch of chemical industry.

P. J. F.

ANIMAL PROTEINS. By H. Garnar Bennett. The Industrial Chemistry Series, edited by S. Rideal. London: Baillier, Tindall & Cox. Pp. 287. Price 15s. net.

"The leather, glue and gelatine trades have been for many years recognised as chemical industries, but the great development of colloidal chemistry in the last few years has given these trades a more definite status as such, and they can now be placed in the category of applied physical chemistry." The above statement is made in the author's preface, and his treatment of the subject in this volume is on those lines. Mr. Bennett, in a clear, concise, and yet comprehensive manner, deals with the whole subject of leather, glue and gelatine manufacture, as a science.

The volume is divided into six parts: Hides for heavy leather; skins for light leather; chrome leathers; miscel-

laneous tannages; gelatine and glue; and miscellaneous proteins and by-products.

In the scope of the volume the author appears to have brought out everything important. He deals with the raw materials for heavy leather manufacture; their preservation and preparation for tanning; the vegetable tannage, and in concise form with the modern theory of tanning, the finishing process, and the general manufacture of sole, belting, harness and upper leathers.

In Part II. the author outlines the principles and general methods of manufacturing light leather, followed by a most important chapter on chrome tanning. Here the author has dealt with the whole question of theory and practice of chrome tanning in clear and concise form.

A portion of the volume is devoted to synthetic tans, and a further portion deals with the properties of gelatine and glue, which are not only interesting, but of great value, both to students and manufacturers, and the by-products of the leather trade, including those of the gelatine and glue trades, are also of interest.

The volume may be described as a novelty, and the author and editor are both to be congratulated on the manner in which the subject is handled. It is a book which will be of value not only to the student, and manufacturer, but also to the chemist, especially the consultant, as he will be able to get a clear insight into the applied science of leather manufacture, and where more detailed information is required, references both technical and scientific are very comprehensive.

In the chapter dealing with the evolution of the leather industry the author has evidently inadvertently made some statements which are incorrect. He says "generally speaking the leather trade firms are not public, but private companies. There is absolutely no trace of co-partnership or profit sharing schemes, or of co-operative production. There is little recognition that the trade's prosperity should be shared in any way with the work people, and still less, any recognition of any right to a voice in industrial conditions."

There are several large tanneries where co-partnership or profit sharing schemes are in existence, and in a number of tanneries employees' bonds exist. His views expressed in this chapter with regard to State control of tanneries, will probably not be acceptable to all readers. The volume is extremely well got up, easy to read, and is most interesting and instructive.

J. G. P.

A Handbook of Laboratory Glass-Blowing. By Bernard D. Bolas. London: George Routledge & Sons, Ltd., 1921 Pp. 106. 3s. 6d. net.

Commencing with a description of the simplest tools and apparatus used in laboratory glass-blowing, Mr. Bolas proceeds to give instruction relating to the manufacture of test-tubes, T-pieces, thistle funnels and other apparatus that can readily be made from glass tubing of small diameter. The instructions are made clear by the use of numerous diagrams contributed by Naomi Bolas.

Satisfactory glass-blowing is an art that can be acquired only by prolonged practice, but the information imparted by this book may save novices much time and labour and may help them when called upon to undertake a new glass-blowing operation.

In later chapters the author gives directions for accomplishing more difficult work, such as the construction of double-surface condensers, sprays, and enclosed thermometers. With reference to double-surface condensers Mr. Bolas says that the work involved requires considerable skill, and that the majority of laboratory workers will find it cheaper to buy than to make them. In most localities probably all but the simplest pieces of apparatus can be purchased more cheaply than they can be manufactured in the laboratory, but some chemists delight in making their own apparatus, and to such workers the book will be useful. Skill in glass-blowing is, moreover, an accomplishment which may be very useful in laboratories remote from centres of civilisation, for the speedy renewal or repair of broken apparatus may depend upon personal effort. The instruction embodied in the book is, however, of too elementary a character to be of much service to professional glass-blowers.

The last six pages of the book consist of a summary of the conditions necessary for success in glass-blowing, and the student would do well carefully to read this summary before he attempts to undertake any glass-blowing operations.

H. F. H.

Canadian Invitation to Engineers

To the Editor of The Chemical Age

Sir,—The American Association for the Advancement of Science, which has a membership of between twelve and fifteen thousand, will meet in Toronto in December next. Like the British Association, it is divided into a number of sections, each presided over by a vice-president. One of these sections is devoted to engineering in all its branches and the officers of this section extend a hearty welcome to any engineers from the British Isles who can make it convenient to be in Canada at that time. —Yours, etc.,

J. B. Tyrrell,
Vice-President and Chairman,
Toronto, July 15, 1921. Engineering Section.

The Claims of the Blind

To the Editor of The Chemical Age.

Sir,—Will you allow me to occupy a few lines in which to tell your readers something which I am sure will interest a vast number of them? It is a gigantic National Whist Drive, to be held in the autumn, and to be called the St. Dunstan's National Whist Drive Championship for the benefit of St. Dunstan's and the National Institute for the Blind. Local, District, and County Championships will be held, and the winners of these will take part in the final contest in London. Hundreds of thousands of people who are keen whist players will, I am sure, be glad to avail themselves of the opportunity of competing in this endeavour to discover who really are the finest exponents of the game in the country. Winners of Local and District Championships will receive prizes and the County Championships silver cups, while the winner of the final will receive a silver challenge cup and £1,000 in cash. Many well-known sympathisers are daily increasing this prize fund, and by the end of the competition it is expected that many thousands of pounds worth of prizes will have been distributed.

Will all who are willing to help in the organisation be so good as to communicate with the Organiser, National Whist Championship, at 306, Regent Street, London, W.1?—Yours, &c.,

Arthur Pearson,
Chairman,
Blinded Soldiers' and Sailors' Care Committee.
July 21, 1921.

Corporation Profits Tax

To the Editor of The Chemical Age

Sir,—The Finance Act is now passing its final stages and this gives us an opportunity to refer to the Corporations Tax, which, even before it is finally on the Statute Book, is already shown to be unworkable, unjust, and to give to the bureaucracy opportunities for inquisitorial methods surpassing anything that has happened in the past.

To begin with, the Corporations Profits Tax puts limited liability companies into a class by themselves, and imposes obligations upon them which private firms, individuals trading on their own account, salaried persons, and professional operators, escape. The Limited Liability Acts were the greatest blessings ever conferred upon commerce and industry and their authors would turn in their graves if they could now see how a new form of taxation was discouraging the extension of industry which should normally go on under these Acts.

The recent decision to exempt co-operative societies from the operations of this Tax is a further injustice which adds point to the argument. If half-a-dozen officers club together and form a company to run a little business, they are liable to this new imposition, while, if a million miners decide to run a co-operative store, they can take a large slice out of the trade of the country and escape all obligation to contribute towards the country's expenses.

Apart from principle, the most practical objection to the new tax is the fact that the Inland Revenue have seized upon it to set up another tax-collecting department, and to extract from unfortunate traders yet another set of figures and particulars. If the Corporation Tax were merely a 5 per cent. added to the Income Tax it would be bad enough, but as things have

turned out, it is nothing of the kind. Traders are required to make up an entirely fresh set of accounts for the purposes of this new tax, making, at least, five sets of accounts which every limited company now has to prepare. (1) Its own account for the purposes of ascertaining what its profits really are, and paying dividends; (2) Income Tax Account worked on the three years' average and showing the profits as ascertained under Income Tax rules after writing back all sorts of legitimate expenses so as to swell the amount of the assessment; (3) Excess Profits Duty Account made up in an entirely different way and brought into relation with the pre-war standard, all calculated on another elaborate set of rules, and producing a figure of profit, totally different to the previous two; Corporations Tax Account made upon the actual year and again subject to special regulations. Thus, the remuneration of directors and managers is limited, and a tax has to be paid on everything over £1,000 a year charged in these respects, &c.

There is the further important point that the Corporation Tax is definitely a tax upon industry and not upon income. It is a departure from the principle of Income Tax. Next, the Corporation Tax has within it grave possibilities for the future. If, for instance, a Labour Government came into power, it would be possible for it to increase this tax indefinitely, and thus at a stroke place all the limited liability companies in the country in an impossible position.

Another point is the effect of the tax upon new enterprise. It is very difficult to start a Joint Stock Company in these days, Somerset House has already doubled all the fees for registration, and capital stamp duty, but investors are not now prepared to put their money into a form of concern which is subject to special taxation if they can find any other way of employing it. If it had not been for the Limited Liability Acts many a smart business man could never have secured the financial backing required; now, the investor or the capitalist who might be inclined to back an investor or the originator of some new enterprise, has to face the terrors of a special and additional tax.—Yours, etc.,

July 26, 1921. ECONOMIST.

The Revolution in America

To the Editor of THE CHEMICAL AGE

SIR,—I should be pleased if you would allow me to comment on the above article by E. J. P. Benn, published in your issue of the 16th. On first reading it seems a most alluring method of dealing with our present industrial troubles. "Make all our workers capitalists and they will be pleased with things under capitalism." I will pass over the fact quoted that the workers were offered stock simply because the rate of interest was not large enough to attract larger investors.

I shall take it as axiomatic that the worker has only one object in saving—to provide for a rainy day, whether the rainy day should come by way of unemployment, sickness, old age, or what not. It is absolutely essential that he should have his savings in a form that can be readily turned into cash on short notice, and, if possible, without depreciation. Interest is of only secondary importance. As a rule the worker will have most to save when his particular firm is doing well. This will also coincide with the time when the shares of that firm are standing high. If he wishes to invest in his own business he will, as a general rule, have to buy in a high market. He is not likely to be unemployed until trade in his particular firm is at a low ebb. The shares also will be standing at a low figure. The worker, being unemployed, wants his savings and finds that his capital has dwindled to an alarming extent, but he cannot wait until the market improves—he has to sell out and learns by bitter experience that it does not pay, and as a result employers and employees will not be drawn any nearer to an understanding which all agree is necessary if our industrial life is to revive.

Workers should be given every encouragement to save, but advice to place these savings into the same industrial undertakings in which they work will, in the long run, increase our industrial troubles. The worker would be well advised not to have all his eggs in one basket, and especially when the basket isn't carried by the worker.

As an example, I may quote my own case. I have had savings to invest. Whilst these were accumulating the shares of my particular company were standing at 33s. to 37s. After 16 years' service I am now, owing to trade depression, unemployed. These same shares are now standing at 25s. to 26s.

Taking into account bonus shares issued, I feel sure that this is much below their actual value, but were my savings there I should have to sell. More by good luck than by good guidance, my savings went into War Saving Certificates, where I am at least sure of getting the amount invested.

A practical solution is, I am afraid, not so easy as your writer seems to think, and his "solution," far from being practical, is distinctly harmful to a good understanding between employees and employers.—Yours, &c.,

Burntisland, July 23. HENRY HILDITCH.

[Our correspondent, like so many other people, is searching for that security which is so commonly talked about but so little understood. If instead of investing his money in War Savings Certificates, a war-time device adopted without reference to economic soundness, he had selected the world's premier gilt-edged security, Consols, his savings would have depreciated far more than the industrial shares which he quotes. No human scheme will give to us perfect and absolute security, and that should surely be recognised. The investment by the workers in the businesses in which they are working must remove from those businesses a large element of risk associated with differences between employers and employed, and give to them greater security. As an illustration, if the capital of the mining companies had been held by the miners, surely the recent dispute would not have taken place?—*ED. C.A.*]

Government and Chemical Warfare

AT a meeting of the 1920 Club, held in the Central Hall, Westminster, on Monday, Sir L. Worthington Evans, M.P., Secretary of State for War, delivered an address on the subject of Imperial defence, disarmament and War Office economy.

In the course of discussion Mr. F. E. Hamer (THE CHEMICAL AGE) drew attention to the recent very full and spirited statement by Sir William Pope in favour of a more open recognition of the need for research in connexion with chemical warfare, and said that Sir William Pope's views represented the attitude of a large body of members of the profession. It was not to be assumed that these distinguished authorities were thirsting to poison mankind with fumes and stenches of a more abominable order than any previously known. Probably they liked war as little as the rest of them, and certainly those he knew were people of an almost aggressively quiet and inoffensive character. But there was some substance in their point that, if chemical warfare had come to stay as one of the most important offensive and defensive weapons, the fact should be more frankly recognised and that the men told off to conduct such researches should not be ranked with the unsportsmanlike class who shot foxes, but should have a recognition and status corresponding to those of scientific investigators into naval construction, gunnery, explosives, aircraft, and other branches of the military and naval services. It was felt that to exhibit a patriotic pride in the efficiency of all the other methods of destroying the enemy and to exclaim in horror at the use of chemical gases was something very like cant, and that the Government might follow the example of the United States in treating the matter rather more openly.

It was stated that a sum appeared in the Estimates in aid of chemical warfare research.

Sir A. Mond on Key Industries

ON July 22, Sir Alfred Mond addressed the council of the Swansea Liberal Association, the meeting having been called chiefly in order that Sir Alfred might justify his action in supporting the Key Industries Bill. He stated that in the Bill there was no violation of the principles of Free Trade, and nothing that was not approved by such great Free Traders as Adam Smith and Cobden. He pointed out that it was only a temporary measure, and that the war had proved how absolutely essential it was to maintain certain key industries in this country. So long as the currency was inflated, if we did not give them some protection we might reasonably expect that our industries would starve, simply because of the ability of our competitors to flood the markets.

Economics in America

By Ernest J. P. Benn

THERE is a hundred years of difference between ourselves and the Americans in the manner in which the science of economics is allowed to govern our industrial and commercial activities. English society is saturated through and through with the uneconomic notion expressed in the three words, "finding a job." From the top to the bottom we all seem to be engaged in finding jobs, and we seldom stop to enquire what is the good of the job apart from the salary which it provides for its holder. Some years ago a Lord Chancellor was reputed to have succeeded in placing all his relatives, down to the third generation, in comfortable jobs, and with such a precedent to guide him it is little wonder that the labourer seems always to be searching for excuses for drawing wages without taking his hands out of his pockets. The K.C. cannot appear in Court without a junior, and the mechanic cannot appear on his job without a labourer; we have established an etiquette in these things; even though the labourer, as in the printing trade, often spends his time asleep under the machine, the mechanic dare not do his job unless the labourer is at the same time receiving so much per hour. This same notion is largely responsible for the size of the bureaucracy, and it certainly runs right through the professions. Our characteristic approach towards a job is not to see what good there is in it from the point of view of service, but simply and solely to see what can be got out of it in the way of wages.

The American cannot understand this attitude of mind; he is no less willing than the Englishman to take money for work done, but he does appear to be more interested in the work than in the money. True, he makes a lot of money, but, then, he does a lot of work. Such a very wide gulf is fixed between ourselves and our American cousins in our ways of thinking on these matters that it is no easy task to attempt to explain the difference. The Englishman, as a whole, looks upon his country as the headquarters of wealth, and upon himself as in some mysterious way entitled to a part of that wealth. The country and his fellow-creatures, proud as he is of them, are really regarded by him as fair game for plunder; the American, on the other hand, gets a little nearer to nature, he thinks of his great country, and the wilderness and jungle which it was a few centuries ago, and looks upon it rather as a job to be attended to. He is still within reach of trees that require felling, and lands that require clearing, and in consequence, although he has never held an axe or a spade, he acquires a conception of work which is almost unknown in England.

There is a great deal of industrial literature in America. Almost every firm and factory issues pamphlets, circulars, house organs, works magazines, posters or leaflets, for the edification of the members of its staff—what would be called in this country "employers' dope." A perusal of a great deal of this class of matter helps me to illustrate the point that I am trying to make. This industrial literature is full of ideas that would not be permitted to see the light in England. I have before me a pamphlet on the "Economics of Safety" issued by the United States Rubber Co., Footwear Division. "There are more than two million lost-time accidents every year; now, what does that mean? *Of course*, these two million people lose six million days' pay, at least 20 million dollars; that is obvious." Note the last three words, "that is obvious." Is it? Not to an Englishman! Here is an industrial concern endeavouring to teach its people how to protect themselves from accidents and holding out as an inducement or a reason to them the fact that if they are injured they lose their pay. Reading this sort of argument makes one rub one's eyes and wonder whether it is English language. It is half a lifetime since I ventured to question the sound wisdom of the Workmen's Compensation Act. I have never even indulged in a mental reservation as to the undoubted liability of the employer in the event of an accident, and here I find an employer holding over the heads of his people the threat that if they injure themselves they lose their wages. And this is the most remarkable point about it, I find the people accepting this argument as just, and proper, and right, and that they are as keen among themselves to save the economic waste involved as to save their own skins. I am not suggesting that we should repeal the Workmen's Compensation Act, I am merely pointing out a striking difference on a simple, everyday subject which exists between ourselves and our American friends.

Another pamphlet from the same source is even more remarkable. It is entitled, "Getting Rich Quick," and is an elaborate warning to the workers against the attention of the bucket shop. It is giving advice to working men which would only be understood in this country in circles in close touch with the Stock Exchanges. It gives an example of a catch advertisement of a bogus oil company and then goes on in this fashon: "There are all kinds of ways sharpers have of getting the suckers' money. They look good on paper, and they sound good when a salesman tells about them. How, then, can a man tell when a proposition is shaky? Here are a few points to keep in mind. (1) If a salesman has a proposition that will make you a pile of money in a short time, why doesn't he keep it himself, instead of trying so hard to load it off on you? (2) If anybody tells you that this is a select proposition and that you are one of the select few who are being let in on it, ask yourself, Why does he pick on me? Do I look easy? We may all want to get rich quick, but we don't want to let that make us an easy mark for wild money-making schemes." When I read this remarkable pamphlet I tried to think what would be its effect if it were issued to, say, the miners of South Wales, or the workers in the London docks. It would be so much waste paper; to begin with, they wouldn't understand it, but that is, of course, the least important point that can be deduced. Secondly, if they did understand it, they haven't got the money to take advantage of the good advice offered. Thirdly. if they did understand it and had the money, there is no marked inclination on the part of the British working man to put his money into stocks and shares. Fourthly, if he did understand it and had the money, and had the inclination to invest in securities, the English miner or docker would be promptly discouraged from any such course when he looks into the little matter of English taxation. Fifthly, if all these points were overcome, the Englishman would still be not worth attentions of this kind because no amount of investing which he himself can do can offer to him a tithe of the advantages which he falsely imagines to be his under such commonly accepted theories as the "right to work and the right to maintenance."

It is in little ways like this that the English traveller in America is made aware of the fact at every moment of the day that he is in a strange land, a new world indeed. These are the practical outcome of the doctrine "Nothing for nothing," which is, of course, universally accepted by the 110 millions of Americans. It is the application of these doctrines which ensures to every American the fullest value from all the effort that he can make. The wealth of America is largely made up of the absence of waste. "Nothing for nothing" would seem at first to be a very hard rule for the inefficient, the helpless, the unfortunate, the unsuccessful, but in practice it doesn't work that way. It has the effect of eliminating these people. The American citizen is, no doubt, by nature as prone to helplessness as the Englishman, but helplessness which grows and increases and finds encouragement in the atmosphere of the "right to maintenance" simply flees like chaff before the wind when the mother's milk is flavoured with a dose of "nothing for nothing." The economic point of view of America is producing a virile, active, efficient, eager, happy people; while the economic point of view of England expressed in our enthusiasm for what is euphoniously called social reform is, or so it seems to one who has worn American spectacles, slowly sapping from our constitution all those qualities and virtues which enabled us to build our Empire. As I have ventured to express it before, the Americans are learning to *push*, while we are becoming experts in the art of *leaning*.

Japanese and Chinese drug and chemical manufacturers have drawn up AN AGREEMENT under which the Chinese are to promote a company for the manufacture of drugs and chemicals, and the Japanese are to invest 5,000,000 yen in the enterprise, which will have its head offices in Tientsin and Peking. The company will employ a general adviser and engineers upon the recommendation of the Japanese financial body.

Week-end Conferences on Industry

The Influence of Foreign Exchanges

ON Saturday and Sunday last, the Industrial League held a further highly successful week-end conference, the host being Sir Samuel Waring, Bart., who entertained a party of 20 at his residence, Footscray Place, Kent. The subject of discussion was "Foreign Exchanges and their Influence on Industry," and some 20 representative men in four sessions on Saturday evening and during Sunday debated the matter in all its bearings. The discussion was opened by Mr. H. G Williams, and among those who took part were: Mr. E. J. P. Benn (Messrs. Benn Bros.), Mr. A. Bellamy (National Union of Railwaymen), Mr. A. Dalgleish (Workers' Union), Mr. A. Dumas (British Thomson-Houston Co.), Mr. H. H. Elvin (General Secretary National Union of Clerks), Mr. E. J. Garmeson (Lloyds Bank, Ltd.), Mr. Jabez Hall (Iron & Steel Trades' Confederation), Mr. Hugo Hirst (General Electric Company), Mr. S. E. Jackson (National Union of Railwaymen), Mr. J. W. H. Juddery (Messrs. Juddery & Co.), Mr. R. Sim (National Foremen's Association), Lieut-Col. E. Lawson, the Right Hon. G. H. Roberts, M.P., Mr. E. Wharton (Assistant General Manager London & North-Western Railway), Mr. H. G. Williams (Machine Tool Trades' Association), Mr. H. T. Young (Messrs. Troughton & Young), and Mr. John Ames (General Secretary, Industrial League and Council).

This is the third occasion upon which Sir Samuel Waring has entertained a party at his Kentish home. Indeed, he has done more than anyone to promote and popularise the idea of the week-end conference. The first occasion, so far as is known, upon which representative employers and employed have met together at a private house for the week-end was in March, 1919, when Mr. E. J. P. Benn entertained a small party at Blunt House, Oxted. The experiment was so successful that Sir Samuel Waring was approached to ask that he would take it a step further. Accordingly, a conference was arranged in June, 1919, under his auspices. Since then, both Mr. Benn and Sir Samuel have acted as hosts each year, and others have now joined in this growing movement. Mr. Hugo Hirst, Chairman of the General Electric Co., Mr. H. V. Roe, and Viscount Burnham are among the hosts announced for this scheme. The Industrial League and Council believes that most of our industrial difficulties arise from misunderstanding, and consequently devotes itself to the simple work of bringing representative Trade Unionists and employers together for social intercourse and exchange of opinion. Among the many methods that it adopts for this purpose, the week-end conference is undoubtedly the most effective and delightful. It now seems that the fashion which it has set is likely to be widely followed, and we look in future to the week-end conference as a regular means of educating both sides in industrial problems.

Death of Mr. D. H. Thornton

MR. DAVID HANNAM THORNTON, whose death took place at Harrogate on July 13 at the age of 55, was chairman and managing director of the Shipley Tank Co., Ltd., Bowling Ironworks, Bradford, and a director of the Wentworth Silkstone Collieries, Ltd., Barnsley, and a number of gas companies in Yorkshire. He was a director of the Bradford Dyers' Association for a number of years, and was a well-known business man in the West Riding of Yorkshire. Mr. Thornton led an active life until two years ago, when he met with an accident whilst shooting on the moors. As a result a foot had to be amputated, and he never seemed to recover from this. His two sons are interested in the Shipley Tank Co., Ltd. The elder son, Major W. H. Thornton, after being a director for some years, has now become chairman and managing director in succession to his father.

Mr. W. C. ROBERTSON, chemist to the Victorian Agricultural Department, has recently been in England, with a view to making arrangements for the treatment of a nitrogenous deposit found in the Mornington Peninsula (Australia). This substance has in the past been marketed as a fertiliser, under the name of "Cicada" soil, but it is stated that laboratory investigations have shown that distillation would yield pitch, oils, sulphate of ammonia, &c., in quantities that should give a better return than the sale of the crude product.

Delivery of Caustic Soda

Plaintiffs Obtain Verdict

ON July 14 in the King's Bench Commercial Court before Mr. Justice Bailhache the action was heard of Messrs. Emilio Clot and Ernest Wydler, carrying on business as Emilio Clot and Co., of Turin, against the Compagnie Commerciale du Nord, Societé Anonyme, of Gracechurch Street, E.C., in which the plaintiffs sought to obtain the return of £619 12s. 8d. and interest, and also damages for breach of contract. The latter claim was agreed at £50 subject to the defendants being held liable.

For the plaintiffs Mr. C. J. Conway said they bought 50 tons of caustic soda from the defendants in London, c.i.f. Genoa, the goods being required for the Italian Government: 25 tons were to be delivered in July and 25 in August, 1917. The amount in dispute was 15 tons on the August delivery. The plaintiffs never got the goods, which, in fact, never left London and plaintiffs now asked for their money back. If the goods had been put on board the property would have passed, the contract being c.i.f. Genoa. The £50 which was also claimed was in respect of loss of profit.

Giving judgment his Lordship said the defendants had not complied with what was required of a seller under a c.i.f. contract; they had never put the goods on board, and therefore they were not in a position to call for payment. He had come to the conclusion therefore that the plaintiffs were entitled to the return of the money, as money had been received for a consideration which had wholly failed. That involved a judgment that there was a breach of contract on the part of the defendants in not forwarding these goods in accordance with the contract.

Judgment was therefore given for the plaintiffs, for the return of the money paid and the £50 agreed damages, with costs.

The New Spanish Tariff

THE Board of Trade issued on Thursday as a supplement to the *Board of Trade Journal* the Draft of the proposed new Spanish tariff. This draft tariff is published for general information and, up to September 8th, the Spanish Customs Board will be prepared to receive representations and petitions on the subject of the tariff proposals, which may be submitted in writing by industrial or commercial bodies, or private individuals, who may consider their interests to be affected by the proposals. At the end of the period the Draft Tariff, together with all representations received will be reviewed by the Customs Board, who will, as soon as possible thereafter, submit to the Spanish Government the definitive draft of a new tariff. The Board of Trade propose to invite Chambers of Commerce and Trade Associations in the United Kingdom to submit to them any representations which those bodies may desire to make in the interests of the trade of their members, with a view to such representations as may appear to be necessary being made officially to the Spanish Government with regard to the proposed new tariff in relation to the trade of this country with Spain.

Polish Manufacturer's Failure

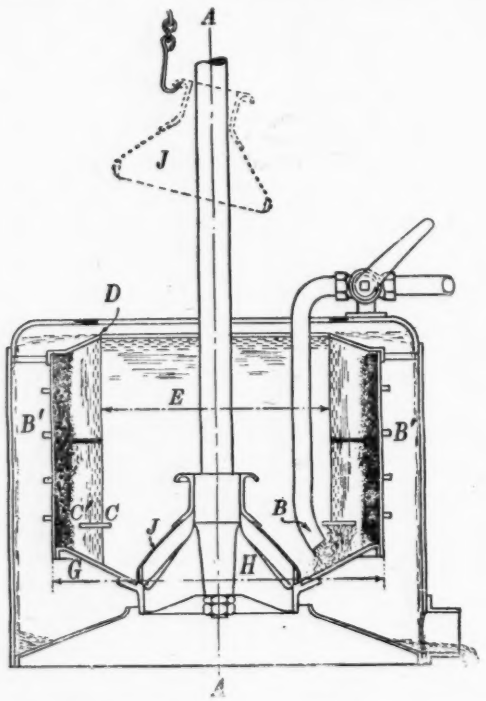
THE Receiving Order in the case of William Rowell, trading as the Rowell Polish Manufacturing Co., 59, Gladstone Street, Leicester, was made on debtor's own petition on July 14, 1921. The statement of affairs showed liabilities amounting to £855 2s. 6d., against net assets of £126 6s. 6d. In 1915 debtor joined the army, and was demobilised in December, 1918. After leaving the army he received a course of instruction in engineering and chemistry at the Loughborough College, and while there started a business in Leicester as a polish manufacturer. His capital was about £290, most of which he borrowed. The debtor moved the business to more suitable premises in September, 1920, in Gladstone Street, Leicester. Debtor appeared to have had a partner from September to December, 1920, who provided £250 as capital. He attributed his position to loss on weekly markets, depreciation of stock owing to bad trade and falling markets, the strike and lack of trade.

Improved Centrifugal Separation of Oil from Soap Stock

By A. Pelafontaine

SINCE the first oil was refined, gravity has always been the method of separating the refined oil from the soap stock, with the exception of the Baskerville process, which requires the addition of certain materials of great absorptive nature to render the soapy mass porous, so as to permit filtration. The refining of oil as now generally done is a slow, expensive method, although some firms have devised novel methods to increase the yields, such as jacketed cones to retain the heat in the refining kettles and special types of paddle agitators to pack the foots better. In conjunction with paddle agitators, one of the largest oil refiners is getting excellent results much better than with the propeller type.

A fact not generally known in refining circles is that the stirring is slowed down when the break first occurs to coagulate the soap stock better and give it a more compact form. The idea of separating soap stock from oil with centrifugal machines occurred to the writer several years ago on reading articles on



centrifugal separation in 1915-1916. At the first opportunity the method was applied with an ultimate view, not only of increasing the yields and eliminating settling, but also finishing of the oil.

One of the main difficulties encountered was in getting a clear oil, free from soap stock, and after many experiments the writer found that the addition of a small amount of soda ash at a specified stage of the refining process not only gave a clean separation, but that the oil was clean, and compared very favourably with oil that had been washed and settled. On some oils another difficulty was to get the soap stock to stick to the sides of the centrifuge, and especially so with cotton and corn oil. Of course, it is feasible to refine oil with soda ash to obtain a firm soap stock, but the colour reaction is not anywhere as pronounced as with caustic refining. Therefore, a way of refining was devised, first, with caustic, using just enough barely to neutralise the fatty acids and adding enough soda ash to form a firm soap. This acts instead of excess alkali.

The centrifuge used first did not give a clean separation, and, after many tests, the machine as outlined in above gave excellent results. The oil is fed from the refining kettle through a pipe, *B*, to the lowest part of the centrifugal machine, the bottom baffle *H* is so arranged to prevent the oil from travelling in a direct trajectory to the outlet of the centrifuge, and the second line of baffles *B'* to provide additional centrifugal action. This is, in reality, a compound acting machine, as the separation of the heavier soap stock is effected in the lower compartment and the lighter parts in the upper. The upper baffles are so arranged that they can be removed quickly, and the whole operation of stopping, cleaning, and re-starting again can be accomplished in ten minutes by an experienced operator. Yields were from ½ to 6 per cent. better than by gravity, and experiments were run on batches of 1,000 to 5,000 grams.

This method means not only a more rapid handling of oils, but permits of a more compact installation, as it is feasible to use a small refining kettle, a reasonable number of machines, and the finishing or washing tanks are eliminated. The oil from the centrifuge can be run straight to the bleaching kettles, and the only oil to be washed is that which remains in the bowl of the centrifugal machine when it is stopped to be cleaned. This oil is run to a separate tank. One machine will hold 450 lbs. of soap stock before it has to be cleaned, and handle from 40,000 to 60,000 lbs. of oil per 24 hours. A patent has been applied for both on the process and the machine.

Light Pattern Radiator Valves

IN order to meet the demand for valves with interchangeable parts, Jenkins Brothers, Ltd., of 6, Great Queen Street, W.C.2, have introduced a light pattern angle radiator valve with wood wheel and union (or with block shield), all parts of which are interchangeable. The valve is fitted with a disc holder containing a composition disc, which is easily replaceable when necessity arises. The wood wheel, which is patented, and is known as the "Kantsplit," consists of a body of hard wood with top and bottom plates of thin sheet steel, nickel plated, and with a hub or centre of hard white metal. The wooden body has four holes drilled into it in such a manner that when the metal has been poured in and has cooled there are four spokes extending radially and at a slight upward angle, nearly to the outside rim of the wheel.

Coal Dust as a Nuisance

IN the King's Bench Division on Monday, Mr. Justice Shearman delivered judgment in a case brought by A. A. Tree, coffee-shop proprietor, of Wapping Wall, against the Commercial Gas Company, Ltd., for damage to his property caused by coal dust from defendants' gas works and coal conveyor. For the gas company, it was maintained that the conveyor was hermetically sealed, and could not emit coal dust. Dr. Bernard Dyer, consulting chemist, gave evidence that a considerable quantity of the dust which had been collected and produced by plaintiff was burned matter, such as ashes and cinders, commonly to be found in industrial districts.

Mr. Justice Shearman allowed plaintiff £200 damages and £50 "special" damages, besides the costs.

A stay of execution was granted.

Institute of Chemistry

THE following candidates have been successful in the recent examinations and have been duly elected Associates of the Institute :—

General Chemistry.—Campbell, Alan Newton, B.Sc. (Lond.); Doolan, James Joseph; Evans, Benjamin Beardmore, B.Sc. (Birm.); Hand, Percy George Terry; Jenkin, John Watson; Pugh, William; Ridge, Bert Fusey; Woolf, Sidney Samuel, B.Sc. (Lond.).

Metallurgical Chemistry.—Storer, George Paterson.

Organic Chemistry.—Kenyon, Frank; Sheldon, Francis Joseph, A.R.C.S., B.Sc. (Lond.).

Chemistry of Foods and Drugs, &c.—Martin, Charles William; Mooney, Paul Michael, B.Sc. (Lond.); Woodward, Miss Elsie.

Chemical Technology (Soap, &c.).—Smith, David Dow. (*Coke Oven Practice, &c.*): Whitaker, John Wilfrid, B.Sc. (Lond.).

The first shipment of GERMAN POTASH SALTS to reach the Pacific Coast since the war was landed at San Francisco recently on the Danish steamer "Transvaal." The shipment consisted of 500 tons.

Manchester Chemical Trade

Sir S. W. Royse & Co.'s Monthly Report

THE termination of the coal dispute at the end of last month and the agreements reached in the engineering and other important trades have brought about a more settled feeling and consequently an improved inquiry, but business actually done has been only moderate. Manufacturers and consumers, however, are gradually getting to work again, and there is reason to hope for some better trade after the holiday season. Little business has been passing in sulphate of copper, the demand for home and export being small, but the price has remained steady. Green copperas is more plentiful, and has met with a fair request. Acetates of lime and acetic acid continue to be pressed for sale, but there has been more call for acetate of soda. Lead salts have also been in better request with the firmer tone in the lead market, while carbonate and caustic potash are in moderate demand with little change in price; Montreal potashes continue to be offered at lower figures. A fair amount of business has been passing in yellow prussiate of potash for the home trade; prussiate of soda has been in good demand for export and is firmer, stocks in second hands having been reduced. White powdered arsenic is unchanged. There has been a steady call for tartaric acid, but the price is easier with freer offerings from the Continent. Cream of tartar has been in fair request, but stocks are ample. Citric acid has been quiet, and there is no change to report in bichromates. Oxalic acid is slow of sale, and the price is lower. Borax and boracic acid are unchanged. There has been a rather better demand for alum and sulphate of alumina, and lower prices have been accepted. Lump salammoniac was reduced early in the month by £10 per ton, but little business has been done. Prices of muriate of ammonia have been maintained. Bleaching powder, white caustic soda and ammonia alkali are in rather better request. Business in tar products remains very quiet, there being no stocks and production being still limited. Benzoles and toluoles are in short supply, owing to the coke-ovens having been closed down and the lessened output of gasworks tar. Solvent naphtha is in somewhat better demand for prompt delivery, but little is available and prices are firm. Creosote is steady, but the demand from abroad has fallen away. Crude carbolic acid continues lifeless, but cresylic acid is in better supply, and the price is easier; naphthalenes are unchanged. There is a fair amount of inquiry for pitch for next season, and prices are inclined to be better. Sulphate of ammonia has remained quiet, but the recent reduction in prices will probably stimulate business. Business in farina has been confined to Dutch and stocks are small. Owing to unfavourable climatic conditions on the Continent, makers have advanced their prices and are holding firmly to their limits. Dextrine is dearer in sympathy with farina. During the month turpentine has been up to 115s. per cwt., due to temporary shortage, but with the arrival of shipments the position is easier. Sulphate of barytes has been moving more freely, and with the miners back at work, British producers are in a position to meet all demands. Paraffin wax and scale continue quiet and prices are lower. Castor oil is slow of sale.

Foreign Patents in the United States

IN the interest of national defence and to prevent unwarranted advantages to foreign inventors, Senator Stanley, of Kentucky, has proposed an amendment to the U.S.A. Revised Statutes providing that any patents issued to foreigners must be put in operation and production in reasonable quantities begun within the continental limits of the United States within two years. Failure to comply with that provision entitles the United States to issue a licence which will permit use of the patent. The legislation, Senator Stanley states, is intended to prevent such a situation as arose at the outbreak of the war when the United States was cut off from supplies of dyes which were made only in Germany. German interests had American patents covering more than 1,000 coal-tar products. Had these interests been required to manufacture their products in the United States American industries depending on them would not have been paralysed. Senator Stanley points out that practically every other nation has a law requiring compulsory production, within the country, of patented articles taken out by foreigners.

Aguas Blancas Nitrate Co.

Need of a London Committee

THE twelfth ordinary general meeting of the Aguas Blancas Nitrate Co., Ltd., was held on July 21 at River Plate House, Finsbury Circus, E.C., Mr. C. A. Huni presiding. In moving the adoption of the report and accounts and the payment of a final dividend of 70 per cent., less income tax, making 100 per cent. for the year, on both preference and ordinary shares, Mr. Huni said they had about 11 months' production to deal with in the accounts. The net profit for the year was £58,150, and with the carry-forward from last year there was an available balance of £86,599, which the board proposed should be dealt with as indicated in the report. The item of £123,394 unshipped nitrate stocks referred to a total of 377,342 quintals, of which 257,400 quintals had been sold, and would figure in the accounts for 1921 at a good profit. Unfortunately, since those sales were made the nitrate market had taken an unfortunate turn. Consumption had practically come to a standstill, and the outlook for fresh sales on the coast was a very sorry one.

Negotiations were proceeding with a view to arriving at some arrangement by which cut-throat competition between various nitrate interests should be avoided. Unfortunately, however, at a meeting held in Valparaiso on June 30, the directorate of the Association, without waiting the outcome of the negotiations, had fixed the nitrate producers' f.o.b. selling prices as far ahead as June, 1922. That might have an unsettling effect on the consuming markets and a deterrent influence on the negotiations. It showed that decisions of such importance should not be left to the other side. The Association had been formed to foster propaganda in the consuming markets, and to deal with the sale and financing of its products. All such matters should be controlled, not on the west coast of America, but in or near the centre of the actual markets dealing with the article. What better centre could there be than London, where the controlling executive committee of the Association should be situated instead of in Valparaiso? The different nationalities—Chilian, British, German, and American—should be proportionately represented on such a committee, and the Chilian Government should have a strong representation, but the members composing it should be men thoroughly conversant with all the details of the trade and willing and able to devote the necessary time to the work. It was worth careful consideration whether dealers and competitors should not be drawn into that committee, or, at any rate, frequently consulted, which would only be possible if the committee were centrally situated.

Whatever the causes of the slump in the industry, to his mind the only means of effectively amending matters would be by way of judicious and concentrated propaganda and harmonious work among themselves and with other interested parties.

Oil-Ether Solutions in Anæsthesia

SOLUTIONS of ether in edible oils are being used in anæsthesia. The origin of the idea lies in the fact that in anæsthesia, as ordinarily practised, the ether enters the blood stream via the lungs, and great care has to be taken to adjust the ether air mixture so as not to cause asphyxiation. But the blood also circulates round the alimentary tract, so that ether introduced into the lower intestine can also be taken into the blood stream. The administration of ether itself, however, is impossible since its boiling point is lower than the body temperature. By preparing oil-ether solutions, with known rates of ether evaporation, a safe and uniformly acting injection can be given, and almost before the patient realises it he is under the influence of the anæsthetic. After effects are almost absent too, and over 30,000 successful administrations have been effected in America and elsewhere. Similar solutions have been prepared with oil and ethyl chloride, which boils even lower than ether. Solutions with 13 to 14 per cent. ethyl chloride evaporate regularly, and with constant velocity of evaporation. "Cocktails" of ether oil were administered at the dressing stations towards the end of the war, and extremely painful dressings were avoided in 2,000 cases. The development is due chiefly to Drs. Baskerville and Gwathmey, a well-known American chemist and doctor respectively.

Chemical Matters in Parliament

Nauru Island Phosphates

Mr. Pennefather (House of Commons, July 21) asked the Minister of Agriculture whether a mixture consisting of ground phosphates from Nauru and Ocean Island with basic slag was a fertiliser which the farmer could use as an alternative to basic slag or superphosphate; and whether the percentage of phosphoric acid in this mixture was satisfactory.

Sir Arthur Boscawen said the technical advisers of the Ministry were satisfied that the mixture in question was a perfectly satisfactory fertiliser in all conditions for which basic slag was suitable. There had been comparatively little experience in the use of ground phosphates as an alternative to superphosphate, but there was every reason to believe that the mixture would have good effect when used for arable crops. He understood that the mixture which was now being offered for sale to farmers contained a larger percentage of phosphoric acid than the highest grades of basic slag generally available and a much larger percentage than the lower grades of basic slag which formed the greater part of the British production.

Sir A. Boscawen repudiated a suggestion by Lieut.-Commander Kenworthy that the Ministry of Agriculture was pushing Nauru phosphates to the detriment of fertilisers made in this country.

Naval Cordite Factory

Mr. Waddington (House of Commons, July 20) asked the Parliamentary Secretary to the Admiralty whether the proposed cotton-bleaching factory at Holton Heath, Dorset, when erected and working, would effect any saving over contracting for the material as at present; upon whose advice was the expenditure of £106,000 being incurred; who was in charge of the scheme and what knowledge or experience had he of cotton-bleaching machinery or of cotton bleaching.

Commander Eyres-Monsell said it was confidently anticipated that when the new cotton purifying plant was installed a saving would accrue. Too much importance could not be attached to the necessity for obtaining the purest ingredients in the manufacture of the cordite used by the Navy, and this was most likely to be secured by carrying out cotton bleaching—which was only one of the processes that would be undertaken at the factory—under direct naval supervision. In erecting this plant the Admiralty were following the recommendation of those whose duty it was to advise them on technical work connected with propellants. It would be executed under the supervision of the various Admiralty Departments concerned with new works and machinery, based upon technical data which had been prepared by the Admiralty officers dealing with explosives, in conjunction with the Research Department, after a full study of similar plant in use in the cotton trade. The plant would be operated by the mechanical, chemical, and technical staff of the factory.

Zinc Concentrates

Lieut.-Commander Kenworthy (House of Commons, July 25) asked the President of the Board of Trade the yearly sums expended by H.M. Government in the purchase of zinc concentrates from Australian mines; what amount of these ores was subsequently disposed of; if so, at what price; if he was aware that the production of zinc concentrates has been brought to a standstill in this country owing to the lack of a market, though the quality of the ores mined was superior to those purchased from the Australian mines; and whether, in view of the damaging effect on home production of the policy of the Government, apart from other possible objections, any change of policy was contemplated?

Sir W. Mitchell-Thomson said the sums expended in the purchase of Australian zinc concentrates were: Year ended March 31, 1919, £1,221,859; year ended March 31, 1920, £490,137; year ended March 31, 1921, £151,951. 4,972 tons of concentrates had been sold at an average price of £7 17s. per ton c.i.f. The spelter industry throughout the world was at present extremely depressed, and there was practically no market for ores. He had no reason to think that the Australian purchase contract had contributed materially to the suspension of zinc mining in this country, which was mainly due to the inability of British mine owners to produce except at prices quite out of proportion to the market price of spelter.

British Cellulose Company

Lieut.-Commander Kenworthy (House of Commons, July 25) asked the President of the Board of Trade how much money was advanced to the British Cellulose Co., Ltd., approximately a year ago; and what steps were taken by H.M. Government to ascertain the financial stability of this company before accepting as security for money advanced, the shares issued by it?

Mr. Young said no money had been advanced to the company by the Government since the date of the reconstruction of the company, and the issue of preference shares in March 1920. Advances amounting to £1,450,000 had previously been made for war purposes. The preference shares held by the Government were taken in exchange for debentures after the fullest consideration by the Government of all the circumstances of the case, including the financial position of the company.

German Potash Contract

Sir R. Cooper (House of Commons, July 25) asked the President of the Board of Trade whether the German potash contract had been concluded; what profit the Government had made on this contract; whether the Treasury had collected such profit; and, if not, why this had not been done?

Sir W. Mitchell-Thomson said the German potash contract had been concluded. The net profit on the contract amounted to £28,700. This had not yet been paid to the Treasury. A balance was owing by the agents who distributed the potash on behalf of the Board of Trade. Steps were being taken to collect this balance.

Tungsten

Mr. Armitage (House of Commons, July 20) asked the President of the Board of Trade whether any, and, if so, what, financial help had been given, either by direct grant or special depreciation allowance under the Income Tax or Excess Profits Duty, to the producers of tungsten in this country?

Mr. Young said no direct grant or special financial help had been given. The statutory allowances for special depreciation were made for taxation purposes for this industry, as in other industries. These allowances were based on the amount of the exceptional depreciation or obsolescence of assets due to the war. The cost of certain researches into tungsten production, now concluded, had been defrayed in part by the Department of Scientific and Industrial Research in the ordinary course of their work. The charge to public funds was £3,899.

German Reparation (Recovery) Act

Captain W. Benn (House of Commons, July 21) asked the Financial Secretary to the Treasury what was the amount of money collected under the German Reparation (Recovery) Act between the date of the enforcement of the Act and the date at which the German Government commenced to pay restitution to its traders; and what was the amount collected under the Act since the date when the German Government commenced such payments?

Mr. Young said the German Government recently published a notice in the German Press stating that it would pay to German exporters the equivalent of sums paid to the British Customs under the German Reparation (Recovery) Act, 1921, after the acceptance of the London utimatum, but he had no information that such payments had yet begun to be made. The amount collected under the Act up to the 18th instant inclusive was £198,000.

Mr. Briggs asked the President of the Board of Trade if he was aware that very considerable inconvenience, and at times very serious losses, were being incurred by traders from the delays in passing German goods through the Customs under the Reparation Act; that large quantities of goods for which full statutory declarations had been made were being held up in the Customs, not merely weeks, but months, without any reason being given; that considerable misunderstanding existed as to the exact form the affidavits should take; and would he, in the interests of the business community, arrange that a notice should be issued by the Customs stating the exact form of proof required?

Mr. Young said he assumed that Mr. Briggs referred to goods in respect of which claims for exemption had been made, and he would refer him to the reply given on June 23 to Mr. Myers (*see* THE CHEMICAL AGE, Vol. V., p. 14). Public notices indicating the various exemptions from the levy and the manner

in which claims for exemption should be made had been freely distributed to importers. In cases where the claim to exemption were not in order, the requirements were explained by letter, attention being drawn to the fact that, pending completion of the claim, immediate delivery of the goods might be obtained under bond.

Leadless Paints

Captain Bowyer (House of Commons, July 21) asked the Home Secretary whether, in the experience of Government Departments and of private individuals, the use of leadless paints during the period of the war had shown them to be defective in point of durability, and consequently of economy; and whether he proposed to withdraw or modify circulars issued under his authority to the public in June, 1920 (Form 1,708, 203,818/91), and similar circulars to Government Departments, urging them to discontinue the use of lead paints?

Mr. Shortt said two departmental committees were appointed by the Home Office in 1911 to investigate the danger caused to the workers by the use of lead in painting, the one dealing with buildings and the other with coaches and carriages. These Committees, which included representatives of the employers and workers, conducted exhaustive inquiries, during which they took a great deal of evidence as to the experience both of Government Departments and private firms in the use of leadless paints, and both Committees recommended (the former with one dissentient, the latter unanimously) that, except for certain special purposes, the use of paints containing more than 5 per cent. of a soluble lead compound should be prohibited. Quite recently further evidence had been submitted as to the results obtained with leadless paints, which appeared to throw some doubt on the conclusions arrived at by these Committees. This evidence, however, had not yet been subjected to critical examination, and he was about to appoint a fresh Committee to examine the new information and generally review the position. He was not prepared on present information to modify, much less withdraw, the circulars mentioned.

Polish Potash Industry

IT is quite probable, states *Chimie et Industrie*, that when the frontiers of New Poland are definitely fixed, the districts of Steppenitz and Kalusz, comprising deposits of salt and potash, in East Galicia, will be allotted to this country; hitherto potash has only been mined at Kalusz. The Kalusz deposits contain chlorides and sulphates of potassium and magnesium, and the upper bed sylvinite and kainite. The bed of kainite is 10 to 12 metres thick, and in some places 17. There are four distinct beds of potash. The sylvinite bed is about two metres thick and contains 25 to 60 per cent. of potassium chloride. The second bed is 1·5 metres thick, and has 12 per cent potassium chloride, being situated 30 metres below the kainite deposit. Below the chief deposit there is a third sylvinite deposit, consisting of two beds, containing 42 per cent. potassium chloride, 12 to 80 metres thick. It is not very probable that the potash mines of East Galicia will be of great importance to foreign markets, and the Kalusz mines can only be of local importance.

Four men were killed and four injured by AN EXPLOSION which occurred on Tuesday morning in a laboratory at Priddy's Hard, the naval shell filling establishment on the Gosport side of Portsmouth Harbour. At the time of the explosion detonators were being conveyed from the proof house to a dumping vessel. Two walls of the laboratory were blown down, and portions of the remains of two men were found among the debris. Only the trunk of the body of one of the other dead was found, and the fourth man killed was so injured as to be unrecognisable.

Practically the whole of the interior of the works of the Mechanical Retorts Co., Ltd., chemical manufacturers, Mac-Kean Street, Paisley, was destroyed by fire on July 21. The outbreak is stated to have originated through the overheating of an engine. The flames spread to the floor, and, owing to the inflammable nature of the material used in the works, the whole building became involved. The offices of the company were, however, saved. The damage, which is believed to be covered by insurance, is estimated at £6,000. The adjoining oil refinery premises of Hugh Highgate & Co. were set alight on two occasions, but the staff were successful in preventing the flames from spreading.

International Chemical Union

The Brussels Conference

AT the second Conference of the International Union of Pure and Applied Chemistry held in Brussels from June 25 to June 30 under the presidency of Professor C. Moureu the following matters came up for discussion: the organisation of the international commission for atomic weights; the remodelling of nomenclature; the unification of bibliographic abbreviations, the unification of chemical abstracts; the international institute of chemical standards; the establishment of thermo-chemical standards; tables of constants; an international laboratory for the analysis of alimentary products; the creation of national and international laboratories for researches in ceramics and fuels; international patents; and hygienic working conditions in chemical industry.

After a cordial reception by the Société Chimique de Belgique, the Council unanimously admitted Argentina, Uruguay, Japan, Monaco, Norway, Portugal, Roumania, Switzerland and Yugo-Slavia to membership of the Union.

The delegates from Great Britain were Sir William J. Pope, K.B.E., Dr. Stephen Miall, and Professor T. M. Lowry.

With regard to the organisation of a commission on atomic weights, it was decided that the membership of the original commission should be enlarged and that the new commission should take the name of the International Commission on Chemical Elements. This commission would be composed of 12 members and would be divided into three sub-committees; the first of these would pay special attention to atomic weights; the second to isotopes; and the third to radio-active bodies. Research will be facilitated by the commission, and periodical reports on the progress made in each section will be prepared.

On the matter of nomenclature it was unanimously agreed that three international commissions be appointed; one for organic chemistry; one for inorganic chemistry; and one for biological chemistry. Each of these commissions will include one delegate from each of the countries represented in the Union.

It was decided to inquire as to the willingness of the principal chemical publications to accept a standard system of bibliographical abbreviations drawn up by the Union. The result of this inquiry will be communicated at the 1922 conference. It was pointed out that a general measure of this kind could only be effective if the majority of journals and periodicals affected would give it their support.

In order to avoid overlapping in the work of the three sections of the International Institute of Standards, the Conference decided that the duties should be allocated as follows:—The Bureau of Physico-Chemical Standards (situated in Brussels); Pure Research Products (situated in England); and the Bureau for the Classification of Industrial and Technological Products (situated in Paris).

The Committee which considered the question of international patents passed a resolution to the effect that the Union should convene a conference with a view to the inauguration of an international patent.

The conference decided to hold the 1922 meeting in France, and the proceedings terminated in a banquet given by the Conseil National de Chimie Belge, at which Professor Moureu and Sir William Pope expressed thanks on behalf of the various delegations for their cordial reception at Brussels during the Conference.

Coagulation Velocity of Gold Sols

AT a meeting of the Faraday Society on June 22, Mr. Emil Hatschek described a simple apparatus for determining the coagulation velocity of gold sols. The percentage of blue formed in coagulation of red gold sol is taken, he explained, as a measure of the degree of coagulation. The percentage is determined by comparing the original red sol with a double wedge, one half consisting of the original sol, and the other of the completely coagulated blue sol. It is necessary that the latter should be coagulated by the same electrolyte as that used in the sol under examination, as the blues obtained with different electrolytes are not exactly alike. A number of determinations have been compared with V. Smoluchowski's formula for the coagulation velocity, and show good agreement for complete and fairly rapid coagulation.

From Week to Week

THE DEATH occurred at Rangoon on July 20 of Mr. Hugh Sim Wilson, of the Burmah Oil Co., Ltd.

Mr. RONALD G. BROWNING, B.Sc., F.I.C., has been appointed chemist to Messrs. J. Kircaldy & Son, of Poplar.

Dr. E. C. S. DICKSON has been appointed senior lecturer in physics in the University of Manchester.

The death is announced in his 64th year of Mr. JAMES MEIKLE, chemical manufacturer, of 14, Ganioch Drive, Glasgow.

Mr. S. GLADSTONE, M.Sc., of East London College, has been appointed lecturer in physical chemistry at Exeter University College.

The exports of PATENT FUEL from South Wales ports last week amounted to 13,196 tons, all of which was shipped at Swansea.

Two cargoes of oil, totalling 4,586,035 gallons of CRUDE PETROLEUM, were brought into Swansea last week from Abadan, Persian Gulf.

Mr. A. W. J. TALBOT, the London manager of Robert Kearsley & Co., Ltd., of Ripon, has been appointed a director in place of the late Mr. W. H. Kearsley.

Mr. W. A. COHEN has severed his connexion with the New York branch of the Keene Company, manufacturing chemists, of 52, Gray's Inn Road, W.C.1.

The UNION GLUE & GELATINE CO., LTD., have removed from 88, Banner Street, E.C., to Cranley Works, Garrett Street, Golden Lane, E.C. 1.

PROFESSOR F. O. BOWER, president of the Royal Society of Edinburgh, has been appointed a Governor of the West of Scotland Agricultural College.

Captain E. M. DE GREEFF, of R. W. Greeff & Co., Ltd., was married on July 5 at Breakeyville, Canada, to Miss Muriel Breakey, daughter of Mr. and Mrs. Dennison Breakey.

A slight OUTBREAK OF FIRE at the premises of Canning & Co., chemical requisites' manufacturers, Birmingham, on July 21, was extinguished before the arrival of the Fire Brigade.

On Wednesday night Princess Mary visited an East End Club, and took part in a dance which was in progress there; her first partner was an UNEMPLOYED CHEMICAL WORKER.

The Central News Geneva correspondent telegraphs that a serious explosion followed a fire at a NITRIC ACID FACTORY on July 21. The fire spread so rapidly that a large number of workers were unable to escape.

FULHAM OIL REFINERS, LTD., has been registered as a private company with a nominal capital of £100. The first directors are Messrs. D. Van den Bergh, managing director of Van den Berghs, Ltd., and E. H. Clokey, joint branch manager of Van den Berghs, Ltd.

The British Oxygen Co.'s NEW OXYGEN WORKS at Leeds are in operation, and their new works at Bootle are on the point of completion, and should be in operation early next month. Work on the company's Belfast works is suspended for the time being.

Mr. A. W. YUILL, of W. P. Naismith & Co., Ltd., Crownpoint Chemical Works, Glasgow, has been appointed by the Minister of Labour as one of the ten members representing employers on the Trade Board established for the boot and floor polish trade in Great Britain.

Mr. A. J. M. SHARPE has resigned his position as managing director of H. S. Willcocks & Co., Ltd., ore, metal and chemical merchants, to take over the direction of the International Metal Service, which commences business on August 1, at 13-14, Walbrook, London, E.C. 4.

At the graduation ceremonial at the University of Edinburgh on July 14, the following degrees were conferred:—Doctor of Science: E. S. Edie—thesis, "Biochemical Researches"; N. E. Parke—thesis, "Specific Heat of Constant Pressure of Hydrogen, Nitrogen, &c." Doctor of Philosophy in the Faculty of Science: M. Carmichael—thesis, "Electro-synthesis in the Series of Dibasic Acids"; A. R. Normand—thesis, "The Boiling Points of Solutions in Methyl Alcohol under Reduced Pressure"; and Mr. P. White—thesis, "Characteristic Frequencies in Elements of Low Atomic Weights (J. Series)."

The Industrial Court, presided over by Sir William Mackenzie sat at Westminster on Wednesday to hear applications for REDUCTIONS IN WAGES by the Drug and Fine Chemical Manufacturers' Association, on the ground of increased foreign competition and the falling-off of demand, due to present trade conditions. The Court's decision will be issued in due course.

Accompanied by Mr. CHARLES DAVIDSON, technical manager of Alexander Cross & Sons, Ltd., 19, Hope Street, Glasgow, the parent organisation of the Cross Fertilizer Co., Ltd., of Sydney, Nova Scotia, Mr. C. K. Walker, president of the latter company, made a tour of the most important fertiliser plants in the United States, with a view to getting new ideas for a plant which is to be erected at Welland, Ontario.

The Chemical & Dyestuff Traders' Association was among the merchants' associations represented at the conference of bankers, merchants, manufacturers and shipowners, held at the Mansion House on Monday, under the presidency of the Lord Mayor, to consider the economic situation of the nation and to urge upon the Government the imperative need of increasing production and reducing expenditure.

South Wales PATENT FUEL MANUFACTURERS have applied for a reduction of 4s. per day in day wages and 20 per cent. on piece rates. This would bring the workmen's wages down to 14s. 6d. per day for a five-day week for labourers, an average of 98s. 9d. a week to piece-workers, 90s. a week to boatmen, 45s. a week to boat boys, and £8 a week to shipping men employed full time. The men have adjourned consideration of the application.

At the meeting of the Travancore Rubber Co. held in Edinburgh on Monday, the Chairman referred to a promising development in the use of the commodity. He said an excellent and cheap RUBBER LINOLEUM, called "Paraflor," had been placed on the market and its use was recommended by the Rubber Growers' Association. As a substantial amount of rubber per square yard is used this maufacture will absorb a large quantity of raw rubber.

A large crowd assembled at the Port Sunlight Recreation Ground on July 23, to witness an ATHLETIC ENCOUNTER between representatives of the works and offices of Lever Bros. Ltd., Cammell, Laird & Co., Ltd., and Harland & Wolff, Ltd., when the Port Sunlight Recreation Association enjoyed the double satisfaction of winning the aggregate by the ample margin of 40 points. Cammell Lairds were second with 31, and Harland & Wolff third with 11 points.

In a report upon the work of the Parliamentary Labour Party, Mr. T. Shaw, M.P., refers to the Dyestuffs Act and states that it was quite clear that the Government did not understand what the cotton trade of Lancashire was. It was actually said at one time that this bill had the support of the cotton industry. The attitude of the Labour Party was that if protection of the dye industry were necessary for the safety of the nation it should either be carried on by the State or the State should see that the public was not bled, and that efficiency, with proper research, was ensured.

The Office of the High Commissioner for Australia has been requested to remind EXPORTERS IN THIS COUNTRY that the prohibition against the importation into Australia of goods manufactured or produced in Germany, Austria, Hungary, Turkey or Bulgaria extends also to goods which derive more than 5 per cent. of their invoice value from the labour of persons resident in any of those countries and/or from material obtained from any of those countries. It should be noted that any goods which contain more than 5 per cent. of ex-enemy labour and/or material, being prohibited imports, are liable to confiscation and render the importer liable to prosecution.

The Trustees of the BEIT FELLOWSHIPS FOR SCIENTIFIC RESEARCH, which were founded and endowed in 1913 by Sir Otto Beit, to promote the advancement of science by means of research, have recently elected to Fellowship Messrs. H. L. Riley and W. A. P. Challenor. Mr. Riley was educated at the Keighley Trade and Grammar School, 1910-17, and has been a student at the Imperial College of Science and Technology since 1919. Mr. Challenor was educated at Whitchurch Grammar School, 1911-17, and has been a student at the Birmingham University since 1917. Both will carry out research at the Imperial College of Science and Technology at South Kensington.

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SULPHITE LYE. Uses of sulphite cellulose liquor. Part I. L. E. Andés. *Kunststoffe*, May (2), 1921, pp. 74-77.

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Patent Literature

Abstracts of Complete Specifications

165,144. FLOTATION TREATMENT OF CARBONACEOUS MATTER. F. B. Jones, 62, London Wall, London, E.C.2, E. Bury, of the Skinningrove Iron Co., Ltd., Saltburn-by-the-Sea, Yorks, and Minerals Separation, Ltd., 62, London Wall, London, E.C.2. Application date, February 18, 1920.

The object is to recover finely divided carbonaceous matter in suspension and also organic materials from the liquor—*e.g.*, fresh water or sea water, which has been used for the scrubbing of coal gas after the removal of tar and ammonia. When this liquor is subjected to the froth flotation process, either alone or after the addition of finely divided carbonaceous matter, it is found that the carbonaceous matter and the organic material, such as cresols, sulpho-cresols, naphthalene, etc., are contained in the froth and are separated from the gangue. It is also found that the liquor may be used as a medium for the recovery of finely divided coal from materials containing it. In this case the liquor may be diluted with an equal quantity of water. When the process is applied to the recovery of the highly carbonaceous shales or "bone" coal, about 0·1 to 0·2 lb. of paraffin oil per ton of crude coal treated is added to the liquor.

165,163. SODIUM FORMATE, MANUFACTURE OF. M. Enderli, Oestrich, Rheingau, Germany. Application date, March 17, 1920.

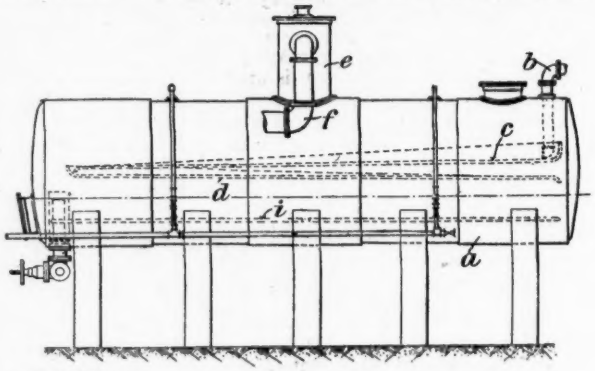
The process is for the manufacture of sodium formate by treating a mixture of sodium sulphate of a strength 20°Be, and the equivalent quantity of milk of lime with carbon monoxide in an autoclave. It is now found that the reaction proceeds with much greater rapidity when the sodium sulphate is greatly diluted—*i.e.*, not more than 7 per cent. of Na_2SO_4. The concentration of sodium formate has no adverse effect. The concentration of sodium sulphate may be maintained within the required limits by the constant presence of basic sodium calcium sulphate $Na_4Ca_3(SO_4)_4(OH)_2$, which is obtained by heating in water, sodium sulphate, calcium sulphate and calcium hydroxide or sodium hydrate; alternatively, the sodium sulphate and calcium sulphate may be replaced by substances which produce them, such as common salt and calcium sulphate. The process may also be carried out by the action of carbon monoxide on a mixture of sodium sulphate, calcium hydroxide and water, the concentration of the sodium sulphate being maintained by replacing the amount consumed. The basic sodium calcium sulphate may be prepared in a separate vessel and passed into the reaction vessel as required. Dilute formate dyes may be used instead of water in this process by which they are converted into concentrated solutions, so that all the formate present may be recovered.

165,167. GASOLENE FROM KEROSENE AND LIKE HYDROCARBON OILS, PROCESS FOR THE PRODUCTION OF. J. G. Trotter, 420, South 38th Street, Birmingham, Alabama, U.S.A. Application date, March 17, 1920.

The oil is subjected to a preliminary treatment with fuming sulphuric acid, and is then heated to boiling point by the injection of gasolene vapour superheated to a very high temperature, which treatment increases its specific gravity. The oil is then sprayed into a body of oil in an initial cracking still through a perforated catalytic copper spray pipe, the oil being at a pressure of 75 lbs. to 100 lbs. per square inch, and a temperature of 500°F.–700°F. Vapour is drawn off until the residuum falls below 58°Be., when it is subjected to the further action of superheated gasolene vapour and steam. The vapour is passed into a second still and sprayed over a steam-heated catalyst composed of nickel-surfaced pipes at a temperature of 800°F.–850°F., and a pressure of about 50 lbs. per square inch. The vapour produced is passed to a third still and sprayed over a steam-heated catalytic surface at a temperature of 900°F.–1,100°F. and a pressure of 40 lbs. per square inch. The oil in each still is subjected to the action of superheated steam and the vapour is finally condensed. The oil residue fractions are treated with gasolene 69°Be. in the form of a vapour superheated above 1,000°F., and maintained at a pressure below 7 atmospheres. The vapour is introduced through a perforated catalytic copper spray pipe submerged in a bath of the oil. The whole of the original charge of kerosene oil or like material is converted into gasolene.

165,178. OIL DISTILLING APPARATUS AND THE LIKE. Whitehall Petroleum Corporation, Ltd., and J. S. Smith, 53, Parliament Street, Westminster. Application date, March 18, 1920.

Oil is delivered through an inlet pipe, *b*, to one end of a slightly inclined tray, *c*, extending nearly to the opposite end of the still *a*. The oil then flows into another reversely inclined

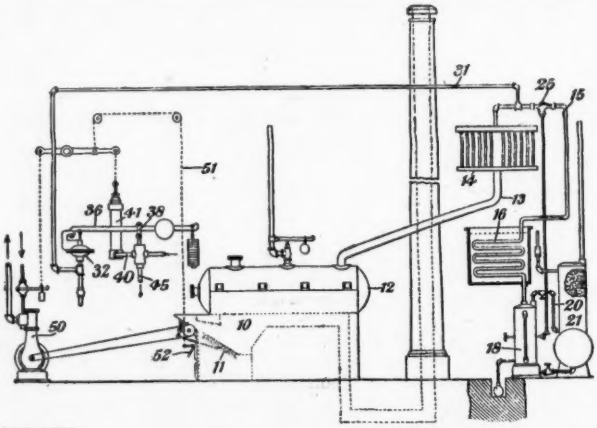


165,178

tray, *d*, both trays being of less width than the still. Oil is partly vaporised on the trays and the vapour is drawn off through the dome *e* and pipe *f*, while the residual oil is allowed to collect in the bottom of the still, so that the heat contained in it is made use of to cause vaporisation of the lighter constituents. Superheated steam may be injected into the oil in the bottom of the still through perforated longitudinal pipes *i*.

165,197. HEAVY PETROLEUM, PROCESS OF DISTILLING TO OBTAIN LIGHT OILS. H. Wade, London. (From Standard Oil Co., Whiting, Ind., and 72, West Adams Street, Chicago, Ill., U.S.A.) Application date, March 20, 1920.

The still 12 is heated by a furnace, 10, provided with a mechanical stoker, 11. A vapour pipe, 13, extends upwards to an air condenser, 14, so that the condensate is drained back into the still, and a vapour outlet pipe, 15, is connected to a water-cooled condenser, 16, the condensate (gasolene) from



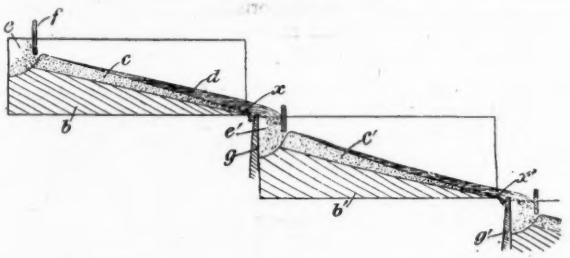
165,197

which passes into a receiving tank, 18. A pipe, 20, leads from the upper end of the tank 18 to the bottom of a Gay-Lussac tower, 21, containing quartz, coke, or the like through liquid passes downwards. A pressure-controlled needle valve, 25, having a very small aperture, is arranged in the pipe 15. Between the condenser 14 and the valve 25 a pressure pipe, 31, is connected, and transmits pressure to the lower side of the diaphragm chamber 32. When petroleum hydrocarbons such as fuel oil, gas oil, or like residues, are to be treated, the valve 25 is fully opened during the initial heating up to about 300°F.,

so that low boiling fractions and water are freely driven off. The valve 25 is then closed until the pressure reaches about 4 atmospheres, when it is slowly opened to allow the vapour to pass the condenser 16. To obtain a uniform quality of distillate in the tank 18, it is necessary that the valve 25 should be controlled to maintain the temperature, pressure and rate of distillation constant within small limits. An excess of pressure in the pipe 31 causes the balance beam 36 to rise and operate a valve attached to a stirrup, 38, so that the pipe 40 is connected to an exhaust pipe, 45. A piston in a cylinder, 41, is thus allowed to fall so that it operates the throttle valve of the steam engine 50, which drives the mechanical stoker. The supply of fuel to the furnace 10 is thus reduced, and at the same time a damper, 52, is operated by a chain, 51, to restrict the supply of air to the furnace. A decrease of pressure in the pipe 31 produces the opposite effect. Vapour is condensed in the condenser 16, and any lighter vapour passes on to the tower 21, where it is treated with a substance such as refined naphtha the specific gravity of which it is desired to reduce.

165,208. SEPARATING AND/OR CONCENTRATING MATERIALS, METHOD OF AND APPARATUS FOR. J. G. Cloke, Woodland View, Devon Consols, Tavistock, Devonshire. Application date, March 23, 1920.

The apparatus is for separating and/or concentrating minerals from gangue, valuable constituents from slag, alluvials, ores, clays or other materials, or for the separation of two or more minerals. It is applicable for concentrating low-grade tin ore. The separation is effected in V-shaped launders, two of which are shown in the illustration. Each launder contains a bed of the material to be separated, b, b^1, which settles at approximately the angle of repose of the heavier

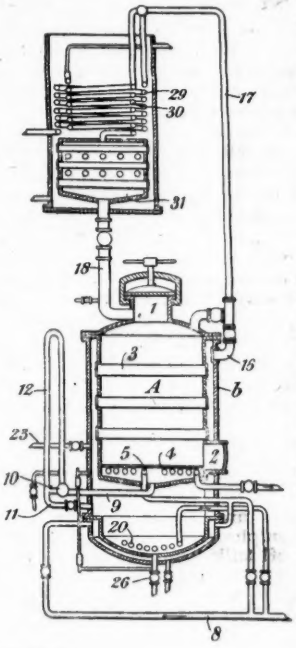


165,208

constituents under the action of a shallow stream of water. The pulp enters the first launder from a well, e, and is regulated by a baffle, f. The heavier particles c, c^1 converge to a point in the apex of the bottom of the outet x, x^1 of each launder. These particles may be diverted by adjustable baffles, g, g^1, and the lighter particles d pass into the next well e^1 for further treatment. The launders may be pivoted so that the ends may be raised or lowered to obtain lesser or greater width of bed. The apex may be truncated or curved. The separating apparatus may consist of a large number of such launders arranged in rows and connected in parallel.

165,226. EXTRACTING OIL OR FAT BY MEANS OF VOLATILE SOLVENTS. J. Arii, 22, Nishikubo Hiromachi, Shiba Ku, Tokyo, Japan. Application date, March 25, 1920.

An extraction chamber, A, is provided with inlet 1 for raw material and outlet 2 for spent material, and is arranged within a chamber, b, in which the mixture of solvent and extracted oil or fat is distilled. The chamber A is provided with lateral tubes 3, through which hot vapour circulates, and with a perforated false bottom, 4, below which a steam heating coil, 5, is arranged. The bottom of the chamber A is connected to the distillation chamber b by pipes 9, 11, and a siphon, 12. A perforated steam pipe, 20, is arranged in the bottom of the chamber b, and both steam pipes are supplied from a main, 8. A steam jacket is arranged around the lower part of the chamber b. Solvent is supplied to the chamber b through the pipe 23, and the vapour passes upwards through the pipe 16, 17 to a helical coil, 30, and condensing chamber 31. The condensed solvent passes through the pipe 18 to the chamber A to extract the oil or fat, and when the level of liquid reaches the top of the siphon 12 the liquid overflows into the vessel b to be distilled. The separated oil or fat accumulates in the vessel b, and is discharged through the pipe 26. When the extraction is complete, the pipes 9, 11 are connected by the valve 10 and all the liquid passes into the chamber b for distillation. At the same time, the solvent vapour is diverted through another pipe coil, 29, to another condenser and storage tank.



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165,230. DISTILLATION OF HYDROCARBON OILS, TARS, ASPHALTS AND THE LIKE. E. F. Engelke, Tampico, Tamaulipas, Mexico. Application date, March 27, 1920.

The object is to treat heavy oils and hydrocarbons containing an appreciable amount of bitumen so as to obtain an increased yield of gasoline and light distillates without the formation of coke. The material is passed through a heat interchanger, tubular preheater, or still to preheat it, and is then fed continuously on to the uppermost of a series of trays in an evaporating chamber. The trays and the bottom of the chamber are divided by partitions into compartments to compel the oil to follow any desired course. Perforated pipes are arranged in the compartments, through which natural gas, distillation gas, oil gas, water gas, or other gas containing free hydrogen is injected into the oil. The gas may be cold, preheated, or compressed if necessary. The hydrogen reacts with the hydrocarbon vapour, and the resulting gas and vapour are drawn off and passed through a condensing system to recover the condensable products. The remaining gas is passed into a gas-holder and returned to the system. The residue from the still is passed through a heat interchanger to preheat the incoming oil. The gas containing free hydrogen may be admitted through perforated pipes into the liquid in the trays, into the vapour spaces above the trays, and into the liquid in the bottom of the still. Super-heated steam may also be injected into the liquid on the trays and in the still. A number of such stills are arranged in a battery in cascade, until the overflow from the last still is of the desired thickness.

165,322. RESINOUS SUBSTANCES, MANUFACTURE OF. A. G. Bloxam, London. (From Akt.-Ges. für Anilin Fabrikation, Berlin, S.O. 36, Germany.) Application date, June 10, 1920.

The ar-tetrahydronaphthol or mixture of ar-tetrahydronaphthols made by alkali fusion from technical tetrahydronaphthalene sulphonic acid is condensed with an aldehyde, with or without a condensing agent. Lacquers made from these resins may become dark on exposure to light, and this is avoided by treating them with acidylating, alkylating, or aralkylating agents. In one example a mixture of 740 parts of ar-tetrahydronaphthol, 250 parts of 30 per cent. formaldehyde, and 20 parts of hydrochloric acid is heated for some time to 60°C. The resulting resin is soluble in alcohol, benzene, dichlorbenzene, linseed oil, and turpentine oil. Several other examples are given. Formaldehyde may be replaced by acetaldehyde, their polymerides, or compounds which form an aldehyde.

NOTE.—Abstracts of the following specifications which are now accepted appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: 138,113 (C. P. Byrnes), relating to a process of making fatty acids and aldehydes from mineral oils and their distillates, *see* Vol. II., p. 362; 140,060 (L. Duparc and C. Urfer), relating to synthetic production of ammonia, *see* Vol. II., p. 562; 151,583 (Wargons Aktiebolag and J. H. Liedholm) relating to production of cyanamide, *see* Vol. III., p. 690; 158,852 (Barrett Co.), relating to distillation of tar, *see* Vol. IV., p. 515.

International Specifications not yet Accepted

163,975. ALUMINIUM CHLORIDE. Aluminium Co., 301, Ninth Street, Oakmont, Pa., U.S.A. (Assignees of F. C. Frary, 301, Ninth Street, Oakmont, Pa., U.S.A.) International Convention date, May 26, 1920.

A mixture of alumina, aluminium and carbon is treated with chlorine, which attacks the aluminium at about 50° C. with the evolution of sufficient heat to enable the carbon to reduce the aluminium. Aluminium chloride is finally produced. The process is carried out in an iron retort lined with a mixture of coke dust and pitch or tar, and heat insulated. The raw material may be aluminium dross, and any deficiency in alumina or aluminium may be made up by adding bauxite or aluminium.

163,980. FORMALDEHYDE. Barrett Co., 17, Battery Place, New York. (Assignees of G. C. Bailey, Woodcliff-on-Hudson, and A. E. Craver, Cliffside, N.J., U.S.A.) International Convention date, May 26, 1920.

A mixture of methyl alcohol vapour and air is passed over a vanadium oxide catalyst heated to 275°C. Wood spirit may be used in place of pure methyl alcohol, and the air may be in large excess. Formaldehyde is produced.

164,001. AMMONIUM SALTS. Elektrizitätswerk Lonza, Gampel, Basel, Switzerland. International Convention date, May 29, 1920.

A mixture of ammonium chloride, ammonium carbonate, and sodium chloride, obtained as a residual liquor in the ammonia soda process, is heated to expel ammonium carbonate and free carbon dioxide, and a solid mixture of ammonium carbonate and bicarbonate is collected. The carbonate may be converted into bicarbonate by adding carbon dioxide. Ammonium chloride is then crystallised out in a pure state by concentrating the solution and cooling to 25°C., and sodium chloride by a further concentration. The latter concentration is preferably effected at boiling point (110°C.) and the crystals removed at that temperature. The residual liquor may be mixed with fresh liquor and concentrated again, or may be treated without further addition as the ammonium and sodium chlorides are in the same proportions as in the original liquor.

LATEST NOTIFICATIONS

166,515. Art of firing boilers by means of fuel oil. Dunham, W. P. July 16, 1920.

166,521. Mercury-vapour pumps for high vacua. Akt.-Ges. Brown, Boverie, et Cie. July 17, 1920.

166,530. Manufacture and production of mordant dyeing colouring matters. Durand & Huguenin Soc. Anon. July 15, 1920.

166,533. Manufacture of spinning nozzles from cermic materials. Kampf, A. July 12, 1920.

166,538. Process of desulphurising iron ores and steel and coke used in metallurgy of iron. Pratt, J. T., Sears, J. D., & Jackson, D. D. July 13, 1920.

166,541. Process and apparatus for purifying hydrogen. Deutsche Gluhfadenfabrik R. Kurtz & Dr. Ing. P. Schwarzkopf Ges. July 13, 1920.

Specifications Accepted, with Date of Application

108,163. Gas purifiers and coolers. H. E. Theisen. May 8, 1916.

128,939. Synthesising ammonia, Process of. Nitrogen Corporation. June 25, 1918.

146,455. Soluble carbo-hydrates, Process for converting cellulose-containing materials into. A. Wohl. March 14, 1917.

149,647. Device for bringing gases or vapours and liquids into intimate contact. T. Schmiedel. March 31, 1920.

165,801. Benzol, toluol and light oils, Process of and means for the recovery of—from coal gas. W. Hill and T. Cook. August 9, 1917.

165,802. Centrifugal machines for purifying, cooling and mixing gases. H. E. Theisen. August 16, 1917.

165,805. Distillation of coal and other carbonaceous substances. S. N. Wellington. April 20, 1918.

165,815. Carbonaceous materials, Treatment of—for the manufacture of power gas with recovery of the hydrocarbon oils. S. Everett and Carboil Syndicate, Ltd. February 5, 1919.

165,816. Separation of gases. W. E. Davies. April 16, 1919.

165,825. Distillation of coal, shale, peat, wood, and other bituminous or organic materials and apparatus therefor. W. E. Davies. May 13, 1919.

165,829. Hydrogen, Apparatus for the production of. A. R. Griggs. June 13, 1919.

165,833. Ammoniacal liquor, Treatment of. J. H. Fairweather. July 9, 1919.

165,838. Aromatic azo compounds and nitro compounds, Process for the reduction of. T. S. Moore. July 18, 1919.

165,863. Distillation and cracking of mineral oils and other hydrocarbon-containing material. N. V. S. Knibbs. September 24, 1919.

166,004. Evaporation of liquids, Method of and apparatus for effecting. F. Merz. May 5, 1920.

166,031. Paraffin wax from petroleum and other substances from solutions. Process for separating. P. T. Sharples. June 9, 1920.

166,033. Azo-dyestuffs for wool, Manufacture of new. A. G. Bloxam. (*Akt.-Ges. für Anilin Fabrikation.*) June 9, 1920.

166,036. Ammonium sulphate saturators. G. P. Heisch. June 18, 1920.

Applications for Patents

Bargate, A. F., Wakley, W. R. Desulphurising petroleum oils. 19,289. July 18.

Blake, S. W. & Penhale, J. Alcohol fuels. 19,463. July 19.

British Thomson-Houston Co., Ltd. (General Electric Co.) Alloys, and methods of manufacturing same. 19,474. July 19.

Collard, C. Extraction of osseine. 19,841. July 23. (France, July 24, 1920).

Davies, A. E., Scottish Dyes, Ltd. & Thompson, R. F. Colouring matters of the anthraquinone series. 19,850. July 23.

Dreyfus, H. Manufacture of solutions, compositions, preparations or articles of cellulose derivatives. 19,531. July 20.

Duncan, H. M., Peddle, C. J., & Parsons, Sir C. A. Manufacture of optical glass. 19,851. July 23.

Dutt, E. E. Preparation of white pigment bases from titaniferous bauxites. 19,422. July 19.

Dutt, E. E., Godfrey, S. H., & Wilson, A. H. Preparation of titaniferous pigments from bauxite. 18,647. July 9.

Dyson, W. H. Purification of chromium ores and residues containing chromium oxides. 19,053. July 14.

Elmore, F. E. Process for production of metallic lead from lead sulphate. 19,082. July 14.

Fairweather, H. G. C. (Air Reduction Co.). Method of producing hydrocyanic acid and cyanides. 18,333. July 6.

,, Method of producing hydrocyanic acid. 18,334. July 6.

Fuller-Lehigh Co. Manufacture of gas. 18,493. July 7. (U. S., November 2, 1920.)

Gillson, S. Manufacture and packing of dyestuffs. 18,136. July 5.

Gluud, W. W. Method of extracting sulphurretted hydrogen from gases. 19,669. July 21.

Godfrey, S. H. Preparation of white pigment bases from titaniferous bauxites. 19,422. July 19.

Goodfellow, J. Apparatus for burning hydrocarbon oils. 18,376. July 6.

Goutal, E., & Hennebutte, H. G. Pyrogenation process. 18,117. July 4. (France, July 2, 1920.)

Harter, H. Process for synthetic production of nitrogen-hydrogen compounds by the contact method. 19,237. July 16.

Hetherington H. Manufacture of lead-chromate pigments. 18,949. July 13.

Hooker Electrochemical Co. Electrolysis of solutions. 19,744. July 22. (United States, August 5, 1920.)

Hottinger, R. Process of sterilising liquids and solid materials or appliances. 19,673. July 21. (Switzerland, June 1.)

Imray, O. Y. (Society of Chemical Industry in Basle). Manufacture of aminoketones and amino alcohols of the quinoline source. 19,536. July 20.

James, G. E. Lubricants. 19,553. July 20.

Johnson, J. Y. (Badische Anilin & Soda-Fabrik). Production of thymol. 19,376. July 18.

Johnson, J. Y. (Badische Anilin & Soda-Fabrik.) Manufacture of finely-divided sulphur. 18,730. July 11.

Kent, A. T. Total gasification of fuel. 19,537. July 20.

Keppler, F. L. Structural glass units, and process of producing same. 18,341. July 6.

Klencke, H. & Schmiedel, T. Process for production of sulphuric acid. 18,806. July 12.

Longbottom, C. A. Manufacture of dolomite, 18,110. July 4.

Lucas, F. L. Mixers and burners for air and gas, or air and hydrocarbon vapour. 19,236. July 16.

McElroy, K. P. Process of fixing nitrogen. 19,025. July 14.

Marr, J. Manufacture of neutral ammonium sulphate. 19,220. July 16.

Niedenzu, K. Manufacture of artificial nitrogenous fertilisers. 18,582. July 8. (Germany, July 23, 1920.)

Nobel's Explosives Co., Ltd. Explosives. 18,729. July 11.

Oehlrich, F. J. G. Process for synthetic production of nitrogen-hydrogen compounds by the contact method. 19,237. July 16.

Paterson, W. Apparatus for treating liquids. 18,563, 18,564. July 8.

Pelly, R. G. & Technical Research Works, Ltd. Process for increasing lubricating properties of oils. 18,441. July 7.

Perkin, A. G., Spencer, G. D. Manufacture of benzanthrone derivative. 18,892. July 12.

Ridout, S. A. Lubricating oil, &c. 19,483. July 20.

Soanes, H. Process for extraction of copper from its ores. 19,538. July 20. (Australia, December 13, 1920.)

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The weekly report contains only commodities whose values are at the time of particular interest or of a fluctuating nature. A more complete report and list are published once a month. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.*

Market Report

THURSDAY, July 28.

There is a steady stream of small business and generally speaking the tone is slowly improving. A very much better turnover is anticipated following the holiday season.

Export inquiry is fair, but no great weight of business is indicated.

General Chemicals

ACETONE is in good request for both prompt and forward delivery, the price is unchanged.

ACETIC ACID passes steadily into consumption without alteration in value.

CITRIC ACID is still a weak market, and there seems little prospect of an early improvement.

FORMIC ACID has been in better inquiry but little actual business is reported.

TARTARIC ACID is firmer in tone, but there are still some realisation parcels in the way of any marked improvement.

BARIUM CHLORIDE sales have been above the recent average. The price continues to favour buyers.

BLEACHING POWDER is a lifeless market.

COPPER SULPHATE.—No change is reported. There are very cheap offerings from the Continent with little business resulting.

FORMALDEHYDE remains in steady demand in small quantities. No weight of business is reported, nor is there any change in price.

LEAD ACETATE has been in much better demand for export but the home market remains dead.

LEAD NITRATE remains unchanged.

POTASH CARBONATE. There is no change.

POTASH BICHROMATE.—There is more inquiry from consumers, and a fair number of small orders are reported. The price of the article still appears to be below its intrinsic value.

POTASH CAUSTIC.—There is a little better demand, but the tendency remains easy.

POTASH PERMANGANATE.—There is no change.

POTASH PRUSSIATE is a firm market, and makers are sold out some way ahead.

SODA ACETATE has been asked for for export, and the outlook seems slightly more hopeful.

SODA BICHROMATE has been in better demand, and in this case also the slump in price seems to have been overdone.

SODA PHOSPHATE.—Little business is reported, and the article remains uninteresting.

SODA PRUSSIATE remains unchanged.

SODA SULPHIDE.—A fair business is passing, but prices are unremunerative.

Coal Tar Products

There is little change in the market since last week, and supplies of certain products remain scarce.

90's BENZOL is practically unobtainable, and is quoted at 3s. on rails for prompt delivery. For delivery in three to four weeks benzol can be bought at 2s. 8d. on rails.

PURE BENZOL is quoted at 3s. 3d.

CREOSOTE OIL is somewhat easier and supplies are becoming more plentiful, and a drop in price appears to be imminent. Creosote is quoted at 8½d. on rails in the North, and 9d. in the South.

CRESYLIC ACID remains unchanged, Pale 97/99 per cent. being quoted at 2s. 6d. on rails, and Dark at 2s. 3d.

SOLVENT NAPHTHA is difficult to obtain for prompt delivery, and is worth about 2s. 8d to 2s. 9d. on rails.

HEAVY NAPHTHA is quoted at 2s. 6d. on rails.

NAPHTHALENE shows no change. Crude qualities are worth about £8 to £11 per ton, and refined from £17 to £23 per ton.

Coal Tar Intermediates

The improvement which we reported last week continues, and while the actual business done has not yet assumed large dimensions the inquiry is still good, and prospects are considerably more favourable than has been the case of late.

ALPHA NAPHTHYLAMINE is in slight demand and there is no change in the price.

ANILINE OIL AND SALT remain in good request and the price continues firm.

BENZIDINE BASE.—Some inquiries have been received, but little business has actually resulted.

BETA NAPHTHOL has been inquired for; absorption of resale parcels should tend to increase the price.

DIMETHYLANILINE is in steady quiet request.

DIPHENYLAMINE has been inquired for, generally on export account.

H. ACID remains an easy market with few buyers.

NITRO BENZOL.—There is a fair inquiry about and price remains unchanged from last week.

PARANITRANILINE continues its upward tendency.

RESORCIN continues firm.

SALICYLIC ACID is steady but the demand is not great.

PITCH.—The market is unchanged and business is very quiet. Makers are maintaining their prices, but buyers are scarce.

Sulphate of Ammonia

The demand for home trade remains fairly satisfactory. Export business is quiet, but buyers are beginning to show a little more interest for delivery during the early part of next year.

Current Prices

Chemicals

	per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	2	3	to	0	2	6
Acetone oil	ton	92	0	0	to	95	0	0
Acetone, pure	ton	95	0	0	to	100	0	0
Acid, Acetic, glacial, 99-100%	ton	62	10	0	to	65	0	0
Acetic, 80% pure	ton	49	0	0	to	50	0	0
Arsenic	ton	100	0	0	to	105	0	0
Boric, cryst	ton	69	0	0	to	70	0	0
Carbolic, cryst. 39-40%	lb.	0	0	6½	to	0	0	7
Citric	lb.	0	2	5	to	0	2	6
Formic, 80%	ton	65	0	0	to	70	0	0
Gallic, pure	lb.	0	4	0	to	0	4	3
Hydrofluoric	lb.	0	0	8½	to	0	0	9
Lactic, 50 vol.	ton	35	0	0	to	37	10	0
Lactic, 60 vol.	ton	40	0	0	to	42	10	0
Nitric, 80 Tw.	ton	41	0	0	to	44	0	0
Oxalic	lb.	0	0	9	to	0	0	9½
Phosphoric, 1.5	ton	55	0	0	to	57	0	0
Pyrogallic, cryst	lb.	0	7	9	to	0	8	0
Salicylic, Technical	lb.	0	1	0	to	0	1	2
Salicylic, B.P.	lb	0	1	5	to	0	1	6
Sulphuric, 92-93%	ton	8	10	0	to	8	15	0
Tannic, commercial	lb.	0	3	6	to	0	3	9
Tartaric	lb.	0	1	5	to	0	1	6
Alum, lump	ton	18	0	0	to	18	10	0
Alum, chrome	ton	37	10	0	to	40	0	0
Alumino ferric	ton	9	0	0	to	9	10	0
Aluminium, sulphate, 14-15%	ton	12	0	0	to	13	0	0
Aluminium, sulphate, 17-18%	ton	15	0	0	to	16	0	0
Ammonia, anhydrous	lb.	0	2	2	to	0	2	4
Ammonia, .880	ton	43	0	0	to	45	0	0
Ammonia, .920	ton	30	0	0	to	32	10	0
Ammonia, carbonate	lb.	0	0	4	to		—	
Ammonia, chloride	ton	65	0	0	to	70	0	0
Ammonia, muriate (galvanisers)	ton	50	0	0	to	52	0	0
Ammonia, nitrate	ton	55	0	0	to	60	0	0
Ammonia, phosphate	ton	95	0	0	to	100	0	0
Ammonia, sulphocyanide	lb.	0	3	0	to	0	3	0
Amyl acetate	ton	420	0	0	to	425	0	3
Arsenic, white, powdered	ton	50	0	0	to	52	0	0

	per	£	s.	d.		£	s.	d.
Barium, carbonate, 92-94%	ton	12	10	0	to	13	0	0
Barium, chlorate	lb.	0	0	11	to	0	1	0
Chloride	ton	16	0	0	to	17	0	0
Nitrate	ton	50	0	0	to	52	0	0
Barium Sulphate, blanc fixe, dry	ton	30	0	0	to	31	0	0
Sulphate, blanc fixe, pulp	ton	16	10	0	to	17	0	0
Sulphocyanide, 95%	lb.	0	1	6	to	0	1	0
Bleaching powder, 35-37%	ton	16	0	0	to	—		
Borax crystals	ton	34	0	0	to	36	0	0
Calcium acetate, Brown	ton	12	0	0	to	13	0	0
,, Grey	ton	19	0	0	to	21	0	0
Calcium Carbide	ton	29	0	0	to	30	0	0
Chloride	ton	12	10	0	to	13	0	0
Carbon bisulphide	ton	65	0	0	to	67	0	0
Casein, technical	ton	90	0	0	to	92	0	0
Cerium oxalate	lb.	0	3	9	to	0	4	0
Chromium acetate	lb.	0	1	2	to	0	1	4
Cobalt acetate	lb.	0	11	6	to	0	12	6
Oxide, black	lb.	0	16	0	to	—		
Copper chloride	lb.	0	1	3	to	0	1	6
Sulphate	ton	35	0	0	to	37	0	0
Cream Tartar, 98-100%	ton	125	0	0	to	130	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde 40% vol	ton	92	10	0	to	95	0	0
Formusol (Rongalite)	lb.	0	3	9	to	0	4	0
Glauber salts, commercial	ton	6	0	0	to	7	0	0
Glycerine, crude	ton	70	0	0	to	72	10	0
Hydrogen peroxide, 12 vols.	gal.	0	2	8	to	0	2	9
Iron perchloride	ton	45	0	0	to	50	0	0
Iron sulphate (Copperas)	ton	4	0	0	to	4	5	0
Lead acetate, white	ton	47	10	0	to	50	0	0
Carbonate (White Lead)	ton	43	0	0	to	46	0	0
Nitrate	ton	55	0	0	to	57	0	0
Litharge	ton	38	10	0	to	40	0	0
Lithopone, 30%	ton	28	0	0	to	30	0	0
Magnesium chloride	ton	18	0	0	to	19	0	0
Carbonate, light	cwt.	2	15	0	to	3	0	0
Sulphate (Epsom salts commercial)	ton	10	10	0	to	11	10	0
Sulphate (Druggists')	ton	18	10	0	to	19	10	0
Manganese, Borate	ton	70	0	0	to	75	0	0
Sulphate	ton	70	0	0	to	75	0	0
Methyl acetone	ton	85	0	0	to	90	0	0
Alcohol, 1% acetone	ton	130	0	0	to	135	0	0
Nickel sulphate, single salt	ton	60	0	0	to	62	0	0
Nickel ammonium sulphate, double salt	ton	62	0	0	to	64	0	0
Potash, Caustic	ton	34	0	0	to	35	0	0
Potassium bichromate	lb.	0	0	9	to	—		
Carbonate, 90%	ton	40	0	0	to	42	10	0
Chloride	ton	38	0	0	to	40	0	0
Chlorate	lb.	0	0	6½	to	0	0	7
Meta bisulphite, 50-52%	ton	120	0	0	to	125	0	0
Nitrate, refined	ton	50	0	0	to	52	0	0
Permanganate	lb.	0	1	6	to	0	1	8
Prussiate, red	lb.	0	2	0	to	0	2	1
Prussiate, yellow	lb.	0	1	2½	to	0	1	3
Sulphate, 90%	ton	31	0	0	to	33	0	0
Salammoniac, firsts	cwt	3	5	0	to	—		
Seconds	cwt	3	0	0	to	—		
Sodium acetate	ton	25	0	0	to	26	0	0
Arsenate, 45%	ton	60	0	0	to	62	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	6½	to	0	0	7
Bisulphite, 60-62%	ton	35	0	0	to	37	10	0
Chlorate	lb.	0	0	5½	to	0	0	5½
Caustic, 70%	ton	24	0	0	to	24	10	0
Caustic, 76%	ton	25	0	0	to	25	10	0
Hydrosulphite, powder, 85%	lb.	0	2	3	to	0	2	6
Hyposulphite, commercial	ton	15	0	0	to	16	0	0
Nitrite, 96-98%	ton	45	0	0	to	46	0	0
Phosphate, crystal	ton	25	0	0	to	27	0	0
Perborate	lb.	0	1	9	to	0	2	0
Prussiate	lb.	0	0	7	to	0	0	7½
Sodium Sulphide, crystals	ton	19	0	0	to	20	0	0
Sulphide, solid, 60-62%	ton	24	0	0	to	25	0	0
Sulphite, cryst	ton	15	0	0	to	16	0	0
Strontium carbonate	ton	85	0	0	to	90	0	0
Strontium Nitrate	ton	84	0	0	to	90	0	0
Strontium Sulphate, white	ton	8	10	0	to	10	0	0
Sulphur chloride	ton	42	0	0	to	44	10	0
Sulphur, Flowers	ton	19	0	0	to	19	10	0
Roll	ton	19	0	0	to	19	10	0
Tartar emetic	lb.	0	1	8	to	0	1	9
Zinc chloride, 102 Tw.	ton	22	0	0	to	23	10	0
Chloride, solid, 96-98%	ton	60	0	0	to	65	0	0
Oxide, 99%	ton	45	0	0	to	47	10	0
Dust, 90%	ton	90	0	0	to	92	10	0
Sulphate	ton	21	10	0	to	23	10	0

Coal Tar Intermediates, &c.

	per	£	s.	d.		£	s.	d.
Alphanaphthol, crude	lb.	0	3	9	to	0	4	0
Alphanaphthol, refined	lb.	0	4	3	to	0	4	6
Alphanaphthylamine	lb.	0	2	9	to	0	3	0
Aniline oil, drums extra	lb.	0	1	6	to	0	1	7
Aniline salts	lb.	0	1	7	to	0	1	9
Anthracene, 85-90%	lb.		—		to		—	
Benzaldehyde (free of chlorine)	lb.	0	4	9	to	0	5	0
Benzidine, base	lb.	0	6	6	to	0	7	6
Benzidine, sulphate	lb.	0	7	0	to	0	7	6
Benzoic acid	lb.	0	2	3	to	0	2	6
Benzoate of soda	lb.	0	2	3	to	0	2	6
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate	lb.	0	8	0	to	0	8	6
Betanaphthol	lb.	0	2	9	to	0	3	0
Betanaphthylamine, technical	lb.	0	9	6	to	0	10	0
Croceine Acid, 100% basis	lb	0	5	0	to	0	6	3
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	6	9	to	0	7	6
Dinitrobenzol	lb.	0	1	5	to	0	1	6
Dinitrochlorbenzol	lb.	0	1	5	to	0	1	6
Dinitronaphthaline	lb.	0	1	6	to	0	1	6
Dinitrotoluol	lb.	0	1	8	to	0	1	9
Dinitrophenol	lb.	0	3	0	to	0	3	3
Dimethylaniline	lb.	0	4	0	to	0	4	3
Diphenylamine	lb.	0	4	6	to	0	4	9
H-Acid	lb.	0	9	0	to	0	10	0
Metaphenylenediamine	lb.	0	5	9	to	0	6	6
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	7	6	to	0	8	0
Monosulphonic Acid (2:7)	lb.	0	7	6	to	0	8	0
Naphthionic acid, crude	lb.	0	4	0	to	0	4	3
Naphthionate of Soda	lb.	0	4	3	to	0	4	6
Naphthylamin-di-sulphonic-acid	lb.	0	5	0	to	0	5	6
Nitronaphthalene	lb.	0	1	5	to	0	1	6
Nitrotoluol	lb.	0	1	4	to	0	1	5
Orthoamidophenol, base	lb.	0	18	0	to	1	0	0
Orthodichlorbenzol	lb.	0	1	1	to	0	1	2
Orthotoluidine	lb.	0	2	3	to	0	2	6
Orthonitrotoluol	lb.	0	0	10	to	0	1	0
Para-amidophenol, base	lb.	0	12	6	to	0	13	0
Para-amidophenol, hydrochlor	lb	0	13	0	to	0	13	6
Paradichlorbenzol	lb.	0	0	7	to	0	0	8
Paranitraniline	lb.	0	4	6	to	0	4	9
Paranitrophenol	lb.	0	2	9	to	0	3	0
Paranitrotoluol	lb.	0	5	9	to	0	6	0
Paraphenylenediamine, distilled	lb.	0	12	6	to	0	13	6
Paratoluidine	lb.	0	7	6	to	0	8	0
Phthalic anhydride	lb.	0	3	9	to	0	4	0
Resorcin, technical	lb.	0	7	6	to	0	8	0
Resorcin, pure	lb.	0	8	0	to	0	8	6
Salol	lb.	0	2	9	to	0	3	0
Sulphanilic acid, crude	lb.	0	1	4	to	0	1	6
Tolidine, base	lb.	0	8	6	to	0	10	0
Tolidine, mixture	lb.	0	2	9	to	0	3	0

The Influence of Solvent upon Ionisation

At the last meeting of the Faraday Society Mr. S. M. Neale described a determination by electrical conductivity methods of the ionisation of picric and paranitrobenzoic acids in mixtures of acetone and water. From the values obtained at 25° and 35°C. the heats of ionisation are calculated. In the case of picric acid the heat of ionisation varies largely with the nature of the solvent, passing through a minimum at about 70 per cent. acetone. In the case of paranitrobenzoic acid the heat of ionisation is sensibly zero both in water and in 44 per cent. acetone, although in the latter solvent the ionisation constant has fallen to one-twentieth of its value in pure water as solvent.

Patents Court Cases

NOTICE is given that an application has been made for the following Patent to be indorsed "Licence of Right" under Sect. 24 of the Patents and Designs Acts, 1907 and 1919: 22,119/1913 (A. T. Schloesing), relating to a process for the absorption of nitrous gases or vapours. Any notice of opposition must be given by Aug. 29, 1921.

The Australian Glass Manufacturing Company has erected a factory near Hobart for the manufacture of glass bottles for Tasmanian and New Zealand requirements. The output will be about 400 gross per week. This company has factories in Victoria, New South Wales, Queensland, and South Australia.

Company News

AGUAS BLANCAS NITRATE CO.—A report of the twelfth ordinary general meeting appears on page 131.

BROKEN HILL PROPRIETARY.—A dividend of 9d. per share is payable on August 7.

INTERNATIONAL NICKEL.—The quarterly dividend of 1½ per cent. on the preferred stock is payable on August 1 to stockholders on the register on July 15.

ALLEN-LIVERSIDGE.—The directors announce an interim dividend, to be paid on August 31, at the rate of 10 per cent. per annum (less tax), for the six months ended April 30.

BRITISH OIL AND CAKE MILLS.—The directors announce an interim dividend on the ordinary shares of 5 per cent. (less income tax) for the current year. Last year 10 per cent. was paid.

UNITED ALKALI CO., LTD.—It is reported that the directors of the United Alkali Co., Ltd., have decided to defer consideration of the payment of any interim dividend until the meeting of the board in October.

BRITISH OXYGEN CO.—For the twelve months ended March 31 last the net profit was £127,856. Although the directors do not, in the present circumstances, think it advisable to recommend the bonus paid annually since 1913-14, shareholders on the final 10 per cent. distribution receive, with the interim 5 per cent., a tax-free 15 per cent. on the year. £122,43, is carried forward.

SANTA RITA NITRATE CO.—For the year 1920 the profit amounted to £37,891, after providing £110 for income tax and £1,812 for corporation tax. A dividend of 25 per cent., less tax, is recommended, compared with 5 per cent. for 1919, and a balance of £20,391 is carried forward, against £7,185 brought in. Owing to the large unsold stocks of nitrate in the world's markets, the oficina was closed in February last, but the extraction of raw material is being continued.

MOND NICKEL CO.—The transfer books were closed for one day only on Wednesday. The report states that, owing to the delay in the final settlement with the Revenue authorities of questions regarding the company's taxation, the directors are unable to present the usual accounts for the year ended April 30, 1921. When these outstanding matters are settled, the accounts will be completed, and due notice will be given of the meeting at which they will be submitted to the shareholders. The directors, however, "have satisfied themselves upon the figures already known" that they are justified in recommending, after payment of the preference dividend (7 per cent.), a distribution of 1s. per share (5 per cent.) on the ordinary capital, free of income tax (against 17½ per cent., tax free). The preference and ordinary dividends will absorb £220,000. Warrants will be posted on Aug. 12.

New Companies Registered

The following list has been prepared for us by Jordan & Sons, Ltd., company registration agents, 116 and 117, Chancery Lane, London, W.C.2:—

LONDON AND TEXAS OIL COMPANY, LTD., Thanet House, 231, Strand, W.C. Oil refiners, manufacturers and producers of oil, gas and liquid fuel. Nominal capital, £8,000 in 8,000 shares of £1 each ordinary. Directors: A. S. Williamson and H. G. W. Timbrell. Qualification of directors, 5 shares.

MIDDLETON BROTHERS, LTD., 184, St. George Street, Stepney, E.1. Oil, colour, lead and glass merchants. Nominal capital, £20,500 in 10,000 preference shares of £1 and 10,000 ordinary shares of £1 each and 10,000 deferred shares of 1s. each. Directors: W. G. Middleton and E. S. Grover (Managing Director). Qualification of directors, £100. Remuneration of directors, Managing Director, £1,050 each.

NONPAREIL PAINT SUPPLY COMPANY, LTD., 15, New Broad Street, E.C. Importers, exporters and manufacturers of paints, enamels, varnishes, &c. Nominal capital, £2,000 in 1,600 ordinary and 400 deferred ordinary shares, all of £1 each. Directors: Tudor A. N. Wilkin and G. A. Lister. Qualification of directors, £100. Remuneration of directors, £150 (free of income tax) as voted; £200 Chairman.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIALS.	REF. NO.
Toronto ...	Colours. Replies to the Canadian Government Trade Commissioner's Office, Portland House, 73, Basinghall Street, London, E.C. 2.	—
Cape Town ...	Paints; oils	65
Dunedin ...	Pig iron; bar iron; sheet iron ...	67
Budapest ...	Druggists' sundries	73
Barcelona ...	Raw materials; oil seeds; metals	77
Buenos Aires	Drugs	82
Chile	Chemicals, &c. Replies to the Inquiry Room Dept. of Overseas Trade, 35, Old Queen Street, London, S.W. 1.	—
Alexandria ...	Zinc, iron. Replies to the Inquiry Room of the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1.	—
Boston ...	Chemicals; tallow; oils; dyes; hides; skins	50
Toronto ...	Manufacturers of Colours... ...	—
Maaslins ...	Chemicals of all kinds; ores; raw materials	94
Buenos Aires	Paints; oils; metals	99
Buenos Aires	Chemicals; glassware	100
Zurich ...	Rubber	95

Tariff Changes

EGYPT.—Import duties of 170 millièmes per litre on perfumery and toilet preparations containing alcohol and 6 millièmes per kilo on denatured spirits, replace the former uniform duty of 10 per cent. *ad valorem*.

ITALY.—A new Customs Tariff, which takes effect from July 1, was published as a Supplement to the Board of Trade *Journal* on July 21. The supplement, which is obtainable from H.M. Stationery Office (6d. net), affects, *inter alia*, oleaginous seeds and residues; oils and fats, animal and vegetable; metallic ores, ashes and slag; scientific instruments; glass; asbestos, graphite and mica; mineral, resinous and tar oils; gums and resins; essential oils, perfumery, soap and candles; organic and inorganic chemical products; fertilisers; dyeing and tanning materials; colours and varnishes; and rubber and gutta-percha.

LATVIA.—H.M. Consul at Riga reports that a revised Customs Tariff, with greatly increased duties, calculated in gold francs, is to be put into force in Latvia as from July 20. Further particulars will be published later in the Board of Trade *Journal* on receipt of a copy of the Tariff. In the meantime, exporters are advised not to ship goods to Latvia without first communicating with the consignees.

FRENCH WEST AFRICA.—Modified coefficients applicable to the import duty on petroleum and petroleum spirit and to the export duties on palm oil, palm kernels and charcoal are notified in the Board of Trade *Journal* (July 21, page 95).

Development of Power Alcohol

As a consequence of the removal of the duties and restrictions on the importation and manufacture of power alcohol, the Alcohol Fuel Corporation, Ltd., of 7, Princes Street, Westminster, S.W.1, announce that they hope shortly to put into operation the preliminary arrangements they have made for the production and sale of Natalite motor spirit in the United Kingdom. In this connexion, Mr. E. S. Shrapnell-Smith, C.B.E., F.C.S., Mr. George W. Watson, M.I.Mech.E., Mr. H. G. A. Harding, F.C.S., and Mr. J. Stanley Arthur have been retained as technical advisors to the corporation.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette

Bankruptcy Information

WILSON & COMPANY, 79, Queen Street, London, asbestos merchants. High Court of Justice. Date of Receiving Order, July 15, 1921. No. of Receiving Order, 451. Creditors' petition.

First Meetings and Public Examinations

MURFIN, W., 26, Farm Road, Rudheath, Northwich, Cheshire. Manager of labour department at Messrs. Brunner, Mond & Co., Ltd., Lostock Gralam, Northwich. Court: Nantwich and Crewe. First meeting: August 3, 1921, at 2 p.m. Official Receiver's office, 9, Brook Street, Stoke-upon-Trent. Public examination, August 18, 1921, at 11.15 a.m., at the Petty Sessional Court House, Edleston Road, Crewe.

WILSON & CO, 79, Queen Street, London, asbestos merchants. High Court of Justice. First meeting, August 3, 1921, 11 a.m., at the Bankruptcy Buildings, Carey Street, London, W.C.2. Date of public examination, October 25, 1921, 11.a.m.; at the above address.

Notice of Dividend

CARTER, W., Claremont, Portland Road, East Grinstead, Sussex, chemist. Court: Tunbridge Wells. 3½d. Supplemental. July 27, 1921. Official Receiver's office, 12A, Marlborough Place, Brighton.

Order Made on Application for Discharge

HARRISON, E., trading in co-partnership with H. E. and F. A. Bonaventura as Felix Bonaventura & Co., at 24, Great Tower Street, London, E.C., residing at Hillside, Duddington Lane, Neasden, Middlesex, chemical merchant and importer. High Court of Justice. Date of Order, June 29, 1921.

Company Winding Up

HENDON METAL WORKS, LTD., 176, The Broadway, Hendon, Middlesex. High Court of Justice. Date of Order, July 19, 1921. Date of presentation of petition, June 27, 1921.

Companies Winding Up Voluntarily

AIRE AND CALDER GLASS BOTTLE WORKS (E. Breffit & Co.), LTD. (in voluntary liquidation).—A general meeting will be held at 40-43, Norfolk Street, Strand, London, on Wednesday, August 24, 1921, at 11 a.m. J. J. Glew, Liquidator.

OIL FREIGHTERS, LTD.—A meeting of creditors will be held at the office of Messrs. Downing, Middleton & Lewis, 22, Great St. Helens, London, on Tuesday, August 2, 1921, at 4 p.m. R. Benson, Liquidator.

ORIENTAL PETROLEUM FUEL CO., LTD. (in voluntary liquidation).—A meeting of creditors will be held at 9, Throgmorton Avenue, London, E.C.2, at 11.30 a.m., on Monday, August 8, 1921. Creditors' claims on or before September 12, to the Liquidator, J. N. Reeves, Britannic House, 23, Great Winchester Street, London, E.C.2.

UNITED GLASS BOTTLE MANUFACTURERS (CHARLTON), LTD. (in voluntary liquidation).—A general meeting of members will be held at 40/43, Norfolk Street, Strand, London, on Wednesday, August 24, 1921, at 12 noon. J. J. Glew, Liquidator.

Liquidator's Notice

WELLINGTON CHEMICAL CO., LTD., Mr. F. J. Braybrooks, Broad Street House, London, E.C., Liquidator.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, created after July 1, 1908, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges which would, if created after July 1, 1908, require registration. The following Mortgages and Charges have been so registered. In each case the total debt, as specified, in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced since such date.*]

BRITISH CELLULOSE & CHEMICAL MANUFACTURING CO., LTD. (late BRITISH CELLULOSE & CHEMICAL MANUFACTURING (PARENT) CO., LTD.), London, S.W.—Registered July 18, £500,000 debentures (filed under sec. 93 (3) of the Companies (Consolidation) Act, 1908), present issue £150,000; general charge. *Nil. December 23, 1920.

BRITISH METAL & TOY MANUFACTURERS, LTD., London, E.C.—Registered July 15, £1,600 and £1,500 debentures, part of £45,000; general charge. *——. December 31, 1920.

BRITISH PHOSPHORISING & CASTING CO., LTD., Birmingham.—Registered July 16, £1,000 debentures (filed under sec. 93 (3) of the Companies (Consolidation) Act, 1908), present issue £350; general charge.

BRITISH SACCHARIN MANUFACTURING CO., LTD., Hull.—Registered July 13, £2,700 debentures (filed under sec. 93 (3) of the Companies (Consolidation) Act, 1908), present issue £2,640; general charge. *Nil. November 29, 1920.

DEWSBURY DYEING & CARBONISING CO., LTD.—Registered July 14, £250 debentures; general charge. *Nil. October 17, 1919.

DUMA RUBBER CO., LTD., London, E.C.—Registered July 13, £300 debentures, part of £15,000; general charge. *Nil. December 30, 1920.

METAL MANUFACTURERS, LTD., London, W.C.—Registered July 14, £10,500 debentures secured by Trust Deed dated June 24, 1921; charged on 90 to 98, Uxbridge Road, Hanwell, also general charge. *£1,000. March 1, 1920.

ROCKWARE GLASS SYNDICATE, LTD., London, E.C.—Registered July 13, mortgage, to Commercial Bank of Scotland, Ltd., securing all moneys due or to become due to the Bank; charged on land at Great Greenford, and company's interest in certain agreements, also general charge. *——. June 24, 1921.

Satisfactions

UNITED GLASS BOTTLE MANUFACTURERS (CHARLTON), LTD. (late MOORE, NETTLEFOLD & CO., LTD.), London, S.E.—Satisfaction registered July 14, £12,000, registered January 6, 1914.

UNITED GLASS BOTTLE MANUFACTURERS, LTD., London, E.C.—Satisfaction registered July 16, £200,000, registered May 14, 1913.

Bill of Sale

[*The undermentioned information is from the Official Registry. It includes Bills of Sale registered under the Act of 1882 and under the Act of 1878. Both kinds require re-registration every five years. Up to the date the information was obtained it was registered as given below; but payment may have been made in some of the cases, although no notice had been entered on the Register.*]

MELVILLE, J. Sunnyfield, Dawes Heath, Thundersley, experimental metallurgist. Filed July 20, £110.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

MATTHEWS, E., High Street, Royston, druggist, £15 18s. 7d. June 8.

DOGG DRUG STORES, 35, Hampstead Road, London, N.W., chemists. £19 14s. 1d., June 2.

NAGELS & CO., 51, Fenchurch Street, London, chemical merchants. £14 11s. 1d. June 2.

WATSON, J., 20, Sussex Street, Warwick Square, Middlesex, chemist. £28 11s. 10d. June 8.

WILLIAMS, M. W., 89, Chalk Farm Road, London, N.W., chemist. £13 7s. 3d. June 7.

WOOLDRIDGE, L. C., 4, Bramshill Road, Harlesden, chemist. £16 7s. 1d. June 3.

GREEN, C., 137, Kew Road, Richmond, oilman. £15 12s. 6d. June 8.

BLUNTS DRUG STORES, 70, Snow Hill, Birmingham, druggists. £22 3s. 1d. June 2.

BOOTH (F. C.) & CO., LTD., R/O., Ocean Works, Camden Street, Birmingham, metal manufacturers. £22 19s. 1d. June 8.

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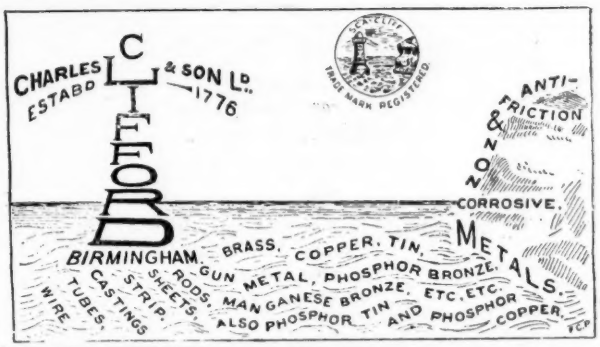
43-45, GREAT TOWER STREET, LONDON, E.C.3.



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